

حمل الآن

مجاناً وحصرياً

المراجعة رقم (1)

اختبار شهر مارس



1 [A] Choose the correct answer from the given answers:

Which of the following processes is considered exothermic?

Choices	Initial temperature	Final temperature
(a)	20°C	25°C
(b)	21°C	17°C
(c)	22°C	12°C
(d)	23°C	23°C

[B] Give reasons for the following:

(1) The deposition process (from the transformations of matter) is exothermic.

*

(2) The refrigeration cycle in the refrigerator includes endothermic and exothermic processes.

*

(3) The danger of adding water to concentrated acid.

*

2 [A] Put (✓) or (X) in front of the following statement:

As the mass of the dissolved anhydrous lithium chloride increases, the amount of raising in temperature increases. ()

[B] From the experiment shown in the opposite figure:

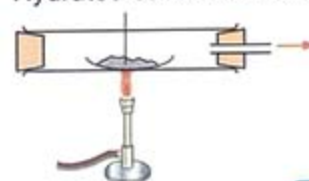
(1) What is the colour change that occur after heating?

*

(2) What happens when adding water to the product of heating?

*

Hydrated cobalt chloride



3 [A] Write the scientific term of the following statement:

The thermal change accompanying the dissolution of a certain amount of solute in a known volume of solvent to form a solution. (.....)

[B] Mention one difference between each of the following:

(1) Dissolution of sodium carbonate in water and dissolution of sodium bicarbonate in water.

*

(2) Instant cold compresses and instant hot compresses.

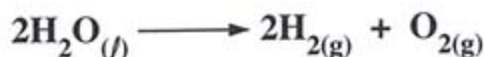
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1 [A] Complete the following sentence:

According to the accompanying thermal changes, the decomposition reaction of ozone gas in the atmosphere is reaction, while the reaction of alkalis with acids is reaction.

1 Mark

[B] From the opposite reaction:



3 Marks

If the amount of energy required for breaking bonds between the atoms of water molecules is 1840 kJ and the amount of energy required for forming bonds between the atoms of both hydrogen and oxygen is 872 kJ, 498 kJ respectively:

(1) Verify the law of conservation of energy using the energy values in this reaction.

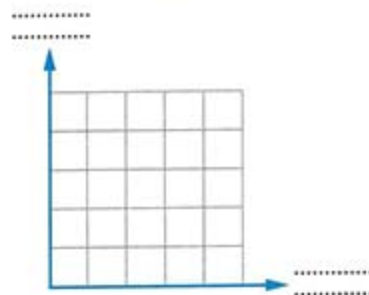
*

.....

(2) Is the reaction exothermic or endothermic?

*

(3) Draw the energy diagram for this reaction.



2 [A] Correct what is underlined in the following statement:

The scientist Antoine Lavoisier proved that energy is neither destroyed nor created from nothing, but rather it can be converted from one form to another. (.....)

1 Mark

[B] Give reasons for the following :

2 Marks

(1) Self-heating cans are used in preparing food without the need for an external heat source.

*

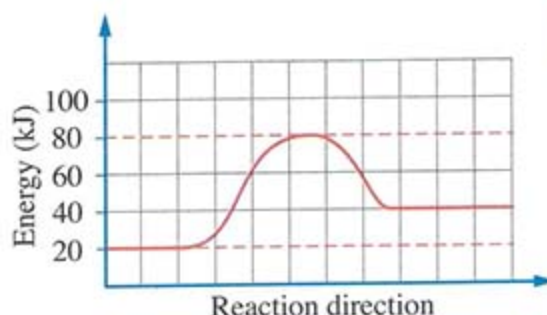
(2) The reaction of barium hydroxide with ammonium chloride is accompanied by the absorption of thermal energy from the surrounding medium.

*

3 [A] Choose the correct answer:

From the opposite energy diagram:
What is the amount of accompanied energy (released or absorbed) of this reaction?

- (a) 20 kJ (b) 40 kJ
(c) 60 kJ (d) 80 kJ



1 Mark

[B] What are the consequences of each of the following:

2 Marks

- (1) The occurrence of exothermic chemical reactions inside the bodies of some luminous insects.

*

- (2) The reaction of aluminium with red iron oxide.

*

Test UNIT 1

Lesson Three

Combustion, Oxidation, and Reduction

10 Marks

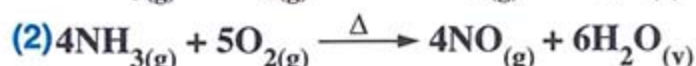
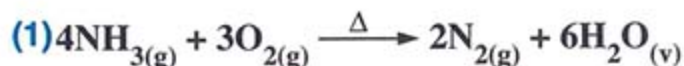
1 [A] Write the scientific term of each of the following:

1 Mark

The amount of energy produced from the combustion of 1 g of fuel in excess of oxygen gas. (.....)

[B] (1) The following two equations shows the reaction of ammonia combustion under different conditions:

3 Marks



- 1- Which of the two equations expresses the complete combustion process of ammonia? With explanation.

*

- 2- Identify the oxidizing agent and the reducing agent in this reaction.

*

- (2) Combustion may occur without the presence of an external ignition source such as a flame, an electric spark, or friction.

What is the term of this type of ignition? Give an example.

*

2 [A] Choose the correct answer :

1 Mark

The fuel of the future is

(a) ethyl alcohol.

(b) natural gas.

(c) hydrogen gas.

(d) petroleum oil.

[B] Give reasons for :

2 Marks

- (1) Water is not used in extinguishing potassium fires.

*

- (2) The combustion of a piece of coal in a cylinder containing pure oxygen is faster than its combustion in atmospheric air.

*

3 [A] Complete the following statement :

1 Mark

The flame of is used as a source of heat in laboratories, and its colour varies depending on the amount of mixed with the fuel.

[B] Hydrocarbon burns in atmospheric air through an exothermic reaction:

2 Marks

- (1) Write the equation of the combustion of methane gas in atmospheric air.

*

- (2) What is the name of the flame produced by the complete combustion of acetylene gas in the presence of excess oxygen, and what is its importance?

*

Exam Model ? ON UNIT 1

24 Marks

Question 1 6 Marks

A Choose the correct answer:

2 Marks

- (1) All the following represent a side of the combustion triangle, **except**

(a) heat. (b) water. (c) fuel. (d) oxygen.

- (2) The following table shows the initial temperature T_1 and final temperature T_2 for four different chemical reactions:

Reaction	T_1	T_2
(1)	22°C	17°C
(2)	21°C	25°C
(3)	20°C	27°C
(4)	20°C	18°C

Which of these reactions produces the largest amount of thermal energy?

(a) (1). (b) (2). (c) (3). (d) (4).

B (1) Which one is better, and why?

2 Marks

1- Instant cold compresses **or** instant hot compresses to reduce swelling.

.....

2- Water **or** sand in extinguishing petroleum fires.

.....

(2) In the reaction: $A + B \longrightarrow C + D$

2 Marks

If the energy absorbed to break the bonds between atoms of molecules (A) is 1640 kJ and between atoms of molecules (B) is 992 kJ, and the energy released from the formation of bonds between atoms of molecules (C) is 1610 kJ and between atoms of molecules (D) is 1840 kJ

Explain with mathematical calculations whether the occurring reaction is exothermic or endothermic?

Question 2 6 Marks

A Put (✓) or (X) of each of the following statements, with correction:

2 Marks

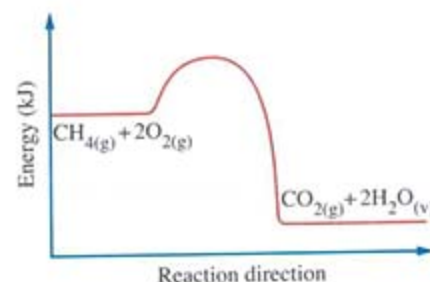
- (1) Butagas is a mixture of methane and propane. ()
- (2) The dissolution of ammonium nitrate in water is accompanied by the absorption of thermal energy. ()

B (1) The opposite energy diagram represents the combustion reaction of methane gas:

2 Marks

1- Identify the oxidizing agent and the substance that was oxidized.

2- Is the reaction exothermic or endothermic? With explanation.



(2) What is meant by each of the following:

2 Marks

- 1- Spontaneous combustion.
- 2- The refrigeration cycle in the refrigerator.

Question 3 6 Marks

A Complete the following statements :

2 Marks

- (1) Thermite reaction is accompanied by the of thermal energy that leads to the melting of produced from the reaction.
- (2) According to thermal energy, the melting of an ice cube is an process, while the reaction of magnesium with dilute hydrochloric acid is an reaction.

B (1) How can we get benefit from:

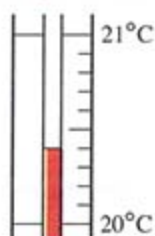
2 Marks

1- Redox reactions in food preservation.

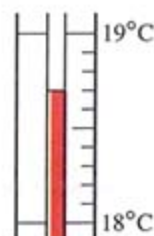
2- Exothermic reactions in coffee preparation.

(2) The following two figures show the initial temperature of water and its final temperature after dissolving the substance (X) in it:

2 Marks



Initial temperature



Final temperature

1- Is the dissolution process exothermic or endothermic? **Explain your answer.**

2- Is the substance (X) calcium chloride or ammonium chloride?
Explain your answer.

Question 4 6 Marks

A Write the scientific term of each of the following statements:

2 Marks

- (1) Energy is neither created nor destroyed, but can be transformed from one form to another. (.....)
- (2) A blue salt turns white upon heating. (.....)

B (1) What are the consequences of each of the following:

2 Marks

- 1- Doubling the mass of the dissolved substance in water while keeping the volume of the solvent constant **"In terms of: Temperature"**.
- 2- Passing hydrogen gas over black copper oxide while heating.

(2) Mention one difference between each of the following:

2 Marks

- 1- Bunsen flame and oxyacetylene flame.
- 2- The reaction of dilute acids with each of sodium bicarbonate and sodium carbonate.

1 [A] Choose the correct answer:

In the opposite figure: The movement of the person when CO_2 gas is rushed from the fire extinguisher represents an application of

- (a) law of inertia. (b) balanced forces.
(c) Newton's second law. (d) Newton's third law.



1 Mark

[B] What happens in the following cases:

(1) If two unequal forces act on a stationary object in opposite directions along the same line of action.

*

(2) If the net force acting on a stationary object is zero.

*

(3) If the net force acting on the same object is doubled (Regarding the acceleration).

*

2 [A] Complete the following statement :

For every action, there is an and reaction.

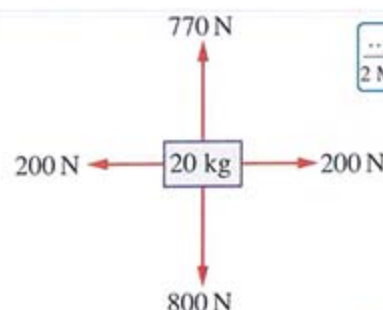
[B] The opposite figure shows a number of forces acting on a stationary object, Calculate:

(1) The net force acting on the object.

*

(2) The acceleration of the object.

*



2 Marks

3 [A] Correct the mistake in the following statement:

When a collision occurs between two objects having the same mass and the same velocity, and moving in opposite directions, each of them acquires an acceleration in the direction opposite to the force acting on each of them.

*

[B] From the opposite figure:

(1) Explain the reason for the change in the state of motion of the passengers when the brakes are applied.

*



2 Marks

كيفية طباعة صفحات معينة من ملف معين

مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



حمل الآن

مجاناً وحصرياً

المراجعة رقم (2)

اختبار شهر مارس



1- A) Complete the following sentences:

- 1 In chemical reactions, the process of breaking bonds represents an reaction, while the process of the forming new bonds represents an reaction.
- 2 Luminous insects emit light from the abdominal area as a result of an occurring inside their bodies.

B) Give a reason for:

- 1 When anhydrous lithium chloride dissolves in water, the temperature of the water rises.
.....
- 2 Water is not used in extinguishing petroleum oil fires.
.....
- 3 The bag placed on the table remains stationary unless someone moves it from its place.
.....

2- A) Answer the following questions:

- 1 What is the importance of self-heating cans?
.....
.....
- 2 The ignition point of substance (X) is 45°C and the ignition point of substance (Y) is 300°C . **Which substance ignites faster? Explain.**
.....
.....

B) Choose the correct answer:

- 1 Which of the following represents an endothermic process?
a) Condensation. b) Melting. c) Freezing. d) Deposition.
- 2 A person tries to push a box with a mass of 40 kg across a rough horizontal surface, but he is unable to do so, the net force acting on the box is equal to
a) zero b) 20 N c) 40 N d) 500 N
- 3 Reaction of metals with dilute acids is similar thermally to
a) melting ice b) water evaporation
c) Thermite reaction d) Sublimation of iodine

3- A) Give an example of each:

- 1 Biofuel.
.....
- 2 endothermic reaction.
.....

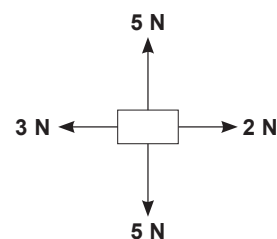
B) What happens...?

- 1 To the flask and piece of wood when mixing barium hydroxide with ammonium chloride.
.....
- 2 When a collision occurs between two moving objects having the same mass and the same speed in opposite directions.
.....
- 3 Adding drops of Glycerine to potassium permanganate powder.
.....
.....

1- A) Choose the correct answer:

1 From the opposite figure, the net force

- a) balanced equal 1 N
- b) unbalanced equal 5 N to the right
- c) balanced equal 5 N
- d) unbalanced equal 1 N to the left



2 When (1 g) of lithium chloride dissolves in water, the initial temperature T1 is 21°C and the final temperature is 25.5 °C, what is the amount of ΔT when (2g) is dissolved in the same amount of water?

- a) 5.4 °C
- b) 9 °C
- c) 3.5 °C
- d) 52.2 °C

B) What happens when...?

1 The bond energy of the molecules of the reactants increases. **(In terms of bond breaking)**

.....

2 Passing the hot freon gas through the pipe network located behind the refrigerator.

.....

3 Adding water droplets to anhydrous cobalt chloride. **(Regarding: color change)**

.....

2- A) Answer the following questions:

1 Calcium oxide reacts with water, according to the following thermochemical equation:



a) **What is the type of reaction (endothermic or exothermic)? Explain.**

.....

.....

b) **Which is greater:** the absorbed energy during breaking bond or the released energy during forming bonds?

.....

2 Identify the odd item, then state the connection between the others:

1) Natural gas – Ethanol – Coal – Petroleum oil.

.....

2) Sodium hydroxide – Sodium carbonate – Sodium bicarbonate – calcium chloride.

.....

3) Fuel – Oxygen – Water – Heat.

.....

3- A) Study the opposite reaction, then determine:



1 the oxidizing agent.

.....

2 the reducing agent .

.....

B) Give a reason for:

1 Rushing the bus passengers forward when the bus stops suddenly.

.....

.....

2 Difference in colors of Bunsen flame.

.....

3 Iron produced from the thermite reaction is in the form of melting iron.

.....

.....

1- A) Put (✓) or (X):

- 1 The temperature of the oxyacetylene flame reaches 2000°C and is used for cutting metals. ()
- 2 Anhydrous substances change into hydrated substances by heating. ()

B) Give a reason for:

- 1 Mass is a scalar physical quantity.
.....
- 2 When a matchstick is struck against a rough surface, it ignites.
.....
.....
- 3 When barium hydroxide powder is added to ammonium chloride powder, the temperature of the surroundings decreases.
.....
.....

2- A) What happens when...?

- 1 Inserting a copper rod and a zinc rod that are connected to the LED bulb into a lemon.
.....
.....
- 2 Passing a stream of hydrogen gas over black copper oxide with heating.
.....

B) Correct the underlined word:

- 1 In the opposite reaction $2\text{Mg} + \text{O}_2 \longrightarrow 2\text{MgO}$, oxygen acts as a reducing agent. (.....)
- 2 In drones, the downward push of air from the engines represents the reaction force. (.....)
- 3 The self-heating cans contain calcium hydroxide and water. (.....)

3- A) Mention the importance or use of each of the following:

- 1** Instant hot compresses

.....

- 2** Thermite reaction

.....

B) Answer the following questions:

- 1** **What is meant by:** Heat of dissolution?

.....

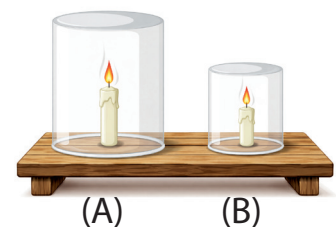
.....

- 2** **Look at the opposite figure, then answer:**

Which of these candles will go out first? Explain.

.....

.....



- 3** A net force acted on an object with a mass of 5 kg, causing it to move with an acceleration of 2 m/s^2 . **Calculate the net force.**

.....

1- A) Write the scientific term:

- 1 The property of objects maintaining their state of rest or motion unless acted upon by external forces. (.....)
- 2 The ignition of materials without the presence of an external source of heat. (.....)

B) first: What is the meant by...?

- 1 Law of conservation of energy.
.....
.....
- 2 Reduction process.
.....
.....

second: What is the importance of :the seat belt in the car?

.....
.....

2- A) Give a reason for:

- 1 When diluting concentrated sulphuric acid, the acid is dripped onto the inner walls of the water container.
.....
- 2 The motorcycle rider is rushed forward when motorcycle collides with a barrier.
.....

B) Complete the following sentences:

- 1 reactions release heat energy, while reactions absorb energy.
- 2 The mixture of propane and is known as butagas.
- 3 and are factors that affect the acceleration of a moving object.

3- A) What happens when....?

- 1 The net force acting on an object is doubled and its mass is decreased to half.
(in terms of acceleration)
-

- 2 Water is used in extinguishing of petroleum oil fires.
-

B) Answer the following:

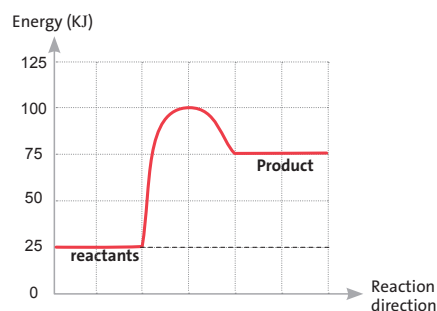
- 1 Look at the opposite figure, then answer:

a) What is the type of this reaction according to thermal changes?

.....

b) Calculate the amount of energy released during the formation of products.

.....



- 2 **Compare between:** Exothermic dissolution and endothermic dissolution.
(in terms of: definition – give one example)

1- A) Put (✓) or (X):

- 1 Hydrated copper sulphate is bonded with 6 water molecules. ()
- 2 The process formation of new bonds in products needs absorption of energy. ()

B) Mention the importance of...:

- 1 Instant cold compresses.

.....

- 2 Spark plugs.

.....

.....

- 3 Fire extinguishers.

.....

2- A) Answer the following questions:

- 1 In the opposite reaction: $\text{PbO}_2 + 2\text{H}_2 \longrightarrow \text{Pb} + 2\text{H}_2\text{O}$

Identify the oxidizing agent and the reducing agent in this reaction.

.....

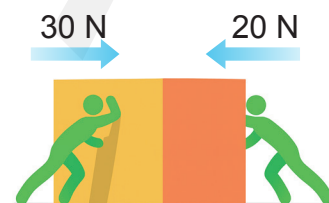
- 2 Look at the opposite figure, then answer:

a) Determine the type of force acting on the box (balanced - unbalanced)?

.....

B) Calculate the net force?

.....



B) Complete the following sentences:

- 1 When hydrated copper sulphate is heated, its color changes from to
- 2 gas is released when all types of fossil fuel are burned.
- 3 Combustion is accompanied by the emission of and

3- A) Give a reason for:

- 1 Condensation process is an exothermic process.

.....

.....

- 2 Fires in frying pans are extinguished by covering them with a metal lid.

.....

B) What is meant by ...?

- 1 Endothermic reactions

.....

.....

- 2 Ignition point

.....

.....

- 3 Net force

.....

.....

1- A) Complete the following sentences:

- 1 In chemical reactions, the process of breaking bonds represents an **endothermic** reaction, while the process of the forming new bonds represents an **exothermic** reaction.
- 2 Luminous insects emit light from the abdominal area as a result of an **exothermic reaction** occurring inside their bodies.

B) Give a reason for:

- 1 When anhydrous lithium chloride dissolves in water, the temperature of the water rises.
 - Because the dissolution of anhydrous lithium chloride in water is an exothermic process, accompanied by a rise in the temperature of the solution.
- 2 Water is not used in extinguishing petroleum oil fires.
 - Because petroleum oil floats on the surface of water due to its lower density compared to water, which leads to the spread of fires instead of extinguishing them.
- 3 The bag placed on the table remains stationary unless someone moves it from its place.
 - Because a stationary object remains at rest unless an external unbalanced force acts on it and changes its state of rest, according to Newton's first law.

2- A) Answer the following questions:

- 1 What is the importance of self-heating cans?
 - Warming coffee or heating the foods inside them.
- 2 The ignition point of substance (X) is 45°C and the ignition point of substance (Y) is 300°C . **Which substance ignites faster? Explain.**
 - Substance (X) ignites faster than substance (Y) because it has lower ignition point and its flammability increases.

B) Choose the correct answer:

- 1 Which of the following represents an endothermic process?
a) Condensation. b) **Melting.** c) Freezing. d) Deposition.
- 2 A person tries to push a box with a mass of 40 kg across a rough horizontal surface, but he is unable to do so, the net force acting on the box is equal to
a) **zero** b) 20 N c) 40 N d) 500 N
- 3 Reaction of metals with dilute acids is similar thermally to
a) melting ice b) water evaporation
c) **Thermite reaction** d) Sublimation of iodine

3- A) Give an example of each:

- 1 Biofuel.
• **Ethanol.**
- 2 endothermic reaction.
• **reaction between sodium bicarbonate with dilute acids.**

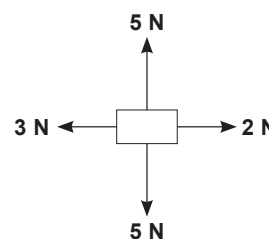
B) What happens...?

- 1 To the flask and piece of wood when mixing barium hydroxide with ammonium chloride.
• **The water between the flask and the piece of wood freezes, causing them to stick together.**
- 2 When a collision occurs between two moving objects having the same mass and the same speed in opposite directions.
• **Both will move in opposite directions at the same velocity.**
- 3 Adding drops of Glycerine to potassium permanganate powder.
• **A spontaneous exothermic reaction occurs, resulting in the emission of smoke and the formation of a purple-colored flame.**

1- A) Choose the correct answer:

1 From the opposite figure, the net force

- a) balanced equal 1 N
- b) unbalanced equal 5 N to the right
- c) balanced equal 5 N
- d) **unbalanced equal 1 N to the left**



2 When (1 g) of lithium chloride dissolves in water, the initial temperature T_1 is 21°C and the final temperature is 25.5°C , what is the amount of ΔT when (2g) is dissolved in the same amount of water?

- a) 5.4°C
- b) **9°C**
- c) 3.5°C
- d) 52.2°C

B) What happens when...?

1 The bond energy of the molecules of the reactants increases. **(In terms of bond breaking)**

- **Bond breaking becomes more difficult because it requires more absorbed energy.**

2 Passing the hot freon gas through the pipe network located behind the refrigerator.

- **It cools down turning into liquid again.**

3 Adding water droplets to anhydrous cobalt chloride. **(Regarding: color change)**

- **It changes from blue to pink hydrated cobalt chloride.**

2- A) Answer the following questions:

1 Calcium oxide reacts with water, according to the following thermochemical equation:



a) **What is the type of reaction (endothermic or exothermic)? Explain.**

- **Exothermic reaction / Because it is accompanied by the release of thermal energy to the surroundings.**

b) **Which is greater:** the absorbed energy during breaking bond or the released energy during forming bonds?

- **The released energy during the formation of product bonds.**

2 Identify the odd item, then state the connection between the others:

1) Natural gas – Ethanol – Coal – Petroleum oil.

- Ethanol / They are fossil fuels.

2) Sodium hydroxide – Sodium carbonate – Sodium bicarbonate – calcium chloride.

- Sodium bicarbonate / They release heat during their dissolution in water.

3) Fuel – Oxygen – Water – Heat.

- Water / They are from the fire triangle.

3- A) Study the opposite reaction, then determine:



1 the oxidizing agent.

- the oxidizing agent is CuO.

2 the reducing agent .

- reducing agent is Mg.

B) Give a reason for:

1 Rushing the bus passengers forward when the bus stops suddenly.

- Because of the inertia of the passengers which makes them resist the sudden change that occurs when pressing brakes.

2 Difference in colors of Bunsen flame.

- Due to the difference in the amount of oxygen mixed with the fuel.

3 Iron produced from the thermite reaction is in the form of melting iron.

- Because it is an exothermic reaction and it is accompanied by the release of enough thermal energy to melt the iron.

1- A) Put (✓) or (X):

- 1 The temperature of the oxyacetylene flame reaches 2000°C and is used for cutting metals. (X)
- 2 Anhydrous substances change into hydrated substances by heating. (X)

B) Give a reason for:

- 1 Mass is a scalar physical quantity.
 - Because it is defined by its magnitude only.
- 2 When a matchstick is struck against a rough surface, it ignites.
 - Because friction generates the heat necessary to start an exothermic chemical reaction.
- 3 When barium hydroxide powder is added to ammonium chloride powder, the temperature of the surroundings decreases.
 - Because it is an endothermic reaction accompanied by the absorption of thermal energy from the surroundings, leading to a decrease in their temperature.

2- A) What happens when...?

- 1 Inserting a copper rod and a zinc rod that are connected to the LED bulb into a lemon.
 - A chemical reaction between zinc and the lemon juice produces electricity, which lights the bulb.
- 2 Passing a stream of hydrogen gas over black copper oxide with heating.
 - A reddish-brown copper element is formed.

B) Correct the underlined word:

- 1 In the opposite reaction $2\text{Mg} + \text{O}_2 \longrightarrow 2\text{MgO}$, oxygen acts as a reducing agent. (magnesium)
- 2 In drones, the downward push of air from the engines represents the reaction force. (action force)
- 3 The self-heating cans contain calcium hydroxide and water. (oxide)

3- A) Mention the importance or use of each of the following:

1 Instant hot compresses

- They relieve pain associated with muscle strain.

2 Thermite reaction

- Melting and welding metals.

B) Answer the following questions:

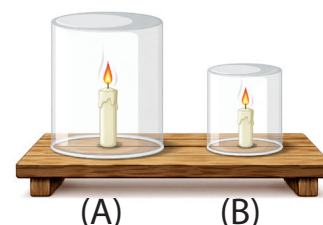
1 What is meant by: Heat of dissolution?

- It is the amount of heat absorbed or released when dissolving a specific quantity of solute in a known volume of solvent to form a solution.

2 Look at the opposite figure, then answer:

Which of these candles will go out first? Explain.

- Candle (B) will go out first, because candle (A) burns for a longer time due to the abundance of oxygen.



3 A net force acted on an object with a mass of 5 kg, causing it to move with an acceleration of 2 m/s^2 . **Calculate the net force.**

- $F = m \times a = 5 \times 2 = 10 \text{ N}$.

1- A) Write the scientific term:

- 1 The property of objects maintaining their state of rest or motion unless acted upon by external forces. (Inertia)
- 2 The ignition of materials without the presence of an external source of heat. (Spontaneous combustion)

B) first: What is the meant by...?

- 1 Law of conservation of energy.
 - Energy is neither destroyed nor created, but it can be transformed from one form to another.
- 2 Reduction process.
 - A chemical process in which the percentage of oxygen decreases in the substance or the percentage of hydrogen increases in it.

second: What is the importance of :the seat belt in the car?

- reduce the rushing forward of the driver towards the steering wheel or windshield during sudden stopping.

2- A) Give a reason for:

- 1 When diluting concentrated sulphuric acid, the acid is dripped onto the inner walls of the water container.
 - Because the water absorbs the released heat without causing damage.
- 2 The motorcycle rider is rushed forward when motorcycle collides with a barrier.
 - Due to the inertia.

B) Complete the following sentences:

- 1Exothermic..... reactions release heat energy, whileendothermic..... reactions absorb energy.
- 2 The mixture of propane andbutane..... is known as butagas.
- 3Mass..... andforce..... are factors that affect the acceleration of a moving object.

3- A) What happens when....?

- 1 The net force acting on an object is doubled and its mass is decreased to half.
(in terms of acceleration)
 - The acceleration increases to 4 times its value.
- 2 Water is used in extinguishing of petroleum oil fires.
 - Spreading of the fire causing severe damage.

B) Answer the following:

1 Look at the opposite figure, then answer:

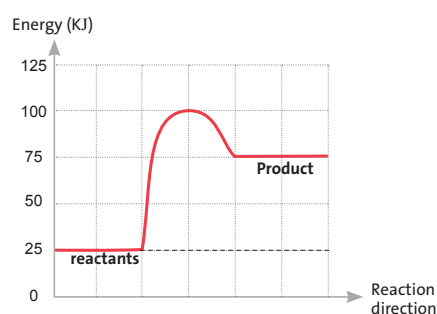
a) What is the type of this reaction according to thermal changes?

- Endothermic reaction.

b) Calculate the amount of energy released during the formation of products.

- Released energy during product formation = $100 - 75 = 25$ KJ.

2 Compare between: Exothermic dissolution and endothermic dissolution.
(in terms of: definition – give one example)



Points of comparison	Exothermic dissolution	Endothermic dissolution
Definition	It is a physical change accompanied by the release of thermal energy to the surroundings when a substance dissolves in water.	It is a physical change accompanied by the absorption of thermal energy from the surroundings when a substance dissolves in water.
Example	Dissolution of Sodium hydroxide in water.	Dissolution of Ammonium nitrate in water.

1- A) Put (✓) or (X):

- 1 Hydrated copper sulphate is bonded with 6 water molecules. (X)
- 2 The process formation of new bonds in products needs absorption of energy. (X)

B) Mention the importance of...:

- 1 Instant cold compresses.
 - They are used to reduce the severity of swelling.
- 2 Spark plugs.
 - They produce a spark used to ignite the mixture of gasoline and air in the combustion chamber of the car engine during starting.
- 3 Fire extinguishers.
 - They put out fires quickly.

2- A) Answer the following questions:

- 1 In the opposite reaction: $\text{PbO}_2 + 2\text{H}_2 \longrightarrow \text{Pb} + 2\text{H}_2\text{O}$

Identify the oxidizing agent and the reducing agent in this reaction.

- The oxidizing agent is PbO_2 .
- The reducing agent is H_2 .

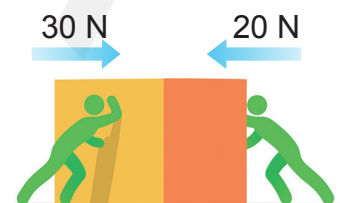
- 2 Look at the opposite figure, then answer:

a) Determine the type of force acting on the box (balanced - unbalanced)?

- unbalanced force.

B) Calculate the net force?

- $30 - 20 = 10\text{N}$



B) Complete the following sentences:

- 1 When hydrated copper sulphate is heated, its color changes from blue to white
- 2 Carbon dioxide gas is released when all types of fossil fuel are burned.
- 3 Combustion is accompanied by the emission of heat and light

3- A) Give a reason for:

- 1 Condensation process is an exothermic process.
 - Because when a gas changes into a liquid, the particles lose heat energy to the surroundings.
- 2 Fires in frying pans are extinguished by covering them with a metal lid.
 - To isolate oxygen, which extinguishes the flame.

B) What is meant by ...?

- 1 Endothermic reactions
 - They are reactions that require the absorption of thermal energy from the surroundings, causing a decrease in the temperature of the surroundings.
- 2 Ignition point
 - It is the temperature at which the material begins to ignite.
- 3 Net force
 - It is the total force in magnitude and direction resulting from the effect of a number of forces acting on an object.

حمل الآن

مجاناً وحصرياً

المراجعة رقم (3)

اختبار شهر مارس



1 Write down what the following sentences mean**Unit 1**

1. Reactions that require the absorption of thermal energy from the surrounding environment, causing its temperature to decrease.
2. Energy cannot be created or destroyed, but it can be converted from one form to another.
3. A diagram showing the path and changes of energy during a chemical reaction from reactants to products.
4. A chemical reaction that results in the release of heat energy from the reaction products to the surrounding environment.
5. A chemical process in which the bonds in the molecules of the reactants are broken and new bonds are formed in the molecules of the products.
6. The name given to the calcium hydroxide produced by the reaction of quicklime with water
7. An isolated system in which the total energy remains constant (as defined by Helmholtz).
8. A closed and repeated thermal process, in which heat is withdrawn from inside the refrigerator to the outside, using eco-friendly freons.
9. The refrigerator coolant liquid.
10. The amount of heat absorbed or released when dissolving a specific quantity of solute in a known volume of solvent to form a solution.
11. Dissolution accompanied by a rise in the temperature of the surroundings.
12. A physical change accompanied by the absorption of thermal energy from the surroundings when a substance dissolves in water.
13. Substances whose molecules are linked to a specific number of water molecules through an exothermic process.
14. A salt whose colour changes from blue to pink when drops of water are added to it.
15. Compresses used only once, in which endothermic or exothermic dissolution occurs.

16. Energy is neither destroyed nor created, but it is transformed from one form to another.
17. A scientist who explained that the total energy remains constant within the isolated system.
18. Cans used for warming coffee or heating the food inside them.
19. The reaction of heating aluminum with red iron oxide.
20. A simple model that illustrates the three main elements of the combustion process.
21. Flammable materials used in the production of thermal energy as a result of the occurrence of an exothermic reaction.
22. The non-renewable fuel which is the most used worldwide till now.
23. The amount of energy produced from the combustion of 1 g of fuel in excess oxygen gas.
24. The combination of fuel with oxygen, accompanied usually by the emission of light, heat, or both.
25. A flame produced from the ignition of a mixture of a gaseous fuel and oxygen.
26. The combustion of fuel in a limited amount of oxygen gas.
27. The temperature at which fuel begins to ignite.
28. Ignition of materials without the presence of an external source of heat
29. A chemical process in which the percentage of oxygen increases in the substance or the percentage of hydrogen decreases in it.
30. A chemical process in which the percentage of oxygen decreases in the substance or the percentage of hydrogen increases in it.
31. The substance that takes away oxygen or gives hydrogen during the chemical reaction.
32. The substance that gives oxygen or takes away hydrogen during the chemical reaction.

33. A scientist who believed that objects do not continue moving unless a force acts continuously on them.
34. A scientist who explained that objects tend to maintain their state of rest or motion unless acted upon by an external force.
35. The total force in magnitude and direction resulting from the effect of a number of forces acting on an object.
36. The scientist who formulated the laws of motion and the universal law of gravitation.
37. object keeps its state of rest or motion at a constant velocity in a straight line, unless acted upon by external unbalanced forces that change its state.
38. The time taken for the moving object to stop.
39. The distance travelled by the moving object during the stopping time.
40. A device used to keep the velocity of cars constant on highways without direct driver intervention.
41. The change in the velocity of an object per unit time.
42. If a net force (F) acts on an object with a mass (m), it causes the object to have an acceleration (a) in the same direction as the net force.
43. A safety device that works with the seat belt in the car to prolong the time of collision, and thus reduce the rate of change in velocity, which in turn minimizes the force of collision acting on the driver.
44. For every action, there is an equal and opposite reaction.
45. A collision between a stationary object and a moving object having the same mass and no loss of kinetic energy occurs.
46. A collision between a stationary object and a moving object having the same mass in which kinetic energy is lost.

2 Complete the following sentences

Unit 1

1. The processes of material transformation and dissolution are accompanied by Processes that are or energy from the



surrounding medium.

2. Exothermic dissolution is accompanied by..... such and
3. Endothermic dissolution is accompanied by Such as and
4. The combination of molecules of some substances with a specific number of water molecules. These substances are called and if the water molecules are removed by heating, the molecules are called
5. The color of hydrated copper sulphate is while the anhydrous copper sulphate is
6. Instant Hot compresses help relieving the pain of while compresses are used in cases of swelling.
7. The color of hydrated cobalt chloride is , while the anhydrous cobalt chloride is
8. When the released energy from combination of solute with solvent is greater than the absorbed energy , the solubility is
9. Ammonium nitrate (NH_4NO_3) is used in instant pressure compresses because its dissolution in water is an endothermic process.
10. Doubling the mass of the solute leads to in the amount of change in the temperature of the solvent (water).
11. Substances that lower the temperature of water when dissolved (such as ammonium nitrate) are described as dissolving.
12. Examples of fuel include : and and
13. Examples of fossil fuels include and and
14. Butagas consists of two gases : and
15. Ethanol is an example of fuel that is prepared from plants rich in such as corn.
16. Fuel begins to ignite when it reaches point.
17. Highly flammable materials have a ignition point of flammable while slow- materials have a ignition point of

18. Fires can be extinguished by or or
19. The oxyacetylene flame is produced by the complete combustion of gas in presence of gas and reaches a temperature of Celsius degrees.
20. Materials that have a low ignition point, while materials that have a high ignition point.
21. flame is produced by the complete combustion of acetylene gas in present of excess oxygen, reaching a temperature of °C
22. Oxidization process leads to shortage of the percentage in the substance. While the reduction process causes an increase percentage in the substance.
23. The oxidizing agent undergoes a process of and the reducing agent undergoes a process of
24. In a chemical reaction, bond breaking is a process, while forming bonds is a process.
25. In the energy diagram of the endothermic reaction, the energy of the products is of the energy of the reactants.
26. The "thermit" reaction is used in and it is reaction
27. In a lemon battery,energy stored in lemon juice is converted to energy
28. Newton's first law states that the object remains or unless an external force affects on it.
29. Force is anything that is capable of changing of the object.
30. Newton's second law states that the resulting force exerted on an object is equal to ×
31. If the force acting on an object is zero, then of the body does not change.
32. Newton's third law states that for every action there is an equal in and opposite in
33. When you push a ball on a flat surface, the value of the acceleration with which it moves depends on the affecting andof the ball.

Unit 2

34. If the force acting on an object increases and its mass remains constant, the of the object increases.
35. When you sit in a car that suddenly stops, your body leans forward due to
36. Elastic collision is the collision that keeps both body's and body's
37. In elastic collision between two objects, the relative velocity of the two objects after the collision is their relative velocity before collision
38. In inelastic collision, a loss of energy occurs in the form of or
39. Air hockey is a fun game in which is used Circular in the push of It slides on a smooth table with holes through which a constant stream of air rushes to reduce between the disc and the table.
40. When balanced forces act on an object, the body While when unbalanced forces affect the same body it
41. Unit of force measurement is , the speed measurement unit is while the acceleration measurement unit is
42. If the resulting force is not equal to zero, so the force is
43. It is recommended to wear a when driving a car.
44. allows the user to fly in the air upwards as the water rushes down through Its openings.
45. The property of the body's resistance to changing its dynamic state is known as
46. works by pushing air from the motors downwards, which is followed by pushing the air upwards with equal force.

3 Give reason for (scientific explanation) for each of the following

- 1) We feel cold when washing our hands with antiseptic hand gel :

Unit 1



- 2) We feel the warmth of our hands when the laundry powder dissolves in water.
.....
- 3) Special precautions must be taken when diluting concentrated acids by adding the acid to water, not the other way around.
.....
- 4) Instant Hot packs (using magnesium sulfate) are used to relieve pain associated with muscle strain
.....
- 5) The mass of the dissolved substance is directly proportional to the change in temperature resulting from the melting process.
.....
- 6) You feel a cooling sensation in your mouth when you eat fizzy candy containing sodium bicarbonate
.....
- 7) The reaction of magnesium with hydrochloric acid is an exothermic reaction.
.....
- 8) Water droplets at the bottom of the flask freeze when barium hydroxide reacts with ammonium chloride.
.....
- 9) The use of thermite reaction in welding railroad tracks.
.....
- 10) The difference in heat content between reactants and products in chemical reactions.
.....
- 11) A reaction is called exothermic if the energy released during bond formation is greater than the energy absorbed during bond breaking.
.....
- 12) Scientists resort to using self-heating containers in expeditions or military applications.
.....
- 13) Fireflies are called by this name (in relation to energy transformations).
.....

- 14) A small percentage of ethanethiol gas is added to both natural gas and Butagas
.....
- 15) Biofuel is prepared from corn plants
.....
- 16) In some countries, biofuel is mixed with gasoline
.....
- 17) The combustion of a piece of steel wool (scouring pad) in a cylinder containing pure oxygen is faster than its combustion in atmospheric air.
.....
- 18) The color of the Bunsen flame used in laboratories varies :
.....
- 19) The Bunsen flame sometimes has a yellow flame and sometimes a blue flame:
.....
- 20) Spark plugs are used in car engines :
.....
- 21) The combustion of carbohydrates produces CO_2 , H_2O : gas
.....
- 22) An oxyacetylene flame is used for cutting or welding metals :
.....
- 23) Potassium permanganate powder reacts when drops of glycerin are added to it :
.....
- 24) Extinguishing sodium or potassium fires with water is strictly prohibited.
.....
- 25) Water is not used to extinguish petroleum fires
.....
- 26) Water is used to extinguish most fires
.....
- 27) Red-hot copper is oxidized when a stream of air passed over it.
.....

28) Black copper oxide is reduced when a stream of hydrogen gas passed over it.

29) Food can be preserved by evacuating air from preservation bags.

30) The substance that happened to oxidation process is called the reducing agent

Unit 2

31) The stationary body remains stationary if it is not affected by force

32) Water spilling from the cup if the cup is moved suddenly

33) Pushing of an empty cart requires less force than pushing a full cart

34) Increasing the acceleration the greater the force exerted on the body

35) The boat moves backwards when you jump from it towards the shore

36) A moving ball stops when it hits a wall

37) A ball bounces from another ball when it collides

38) In elastic collisions, there is no loss of kinetic energy

39) In inelastic collisions, there is a loss of kinetic energy

40) The passengers of the bus rush forward when it comes to a sudden stop.

41) The static bag on the counter remains at rest unless affected by an external force.



42) A large truck loaded with goods is harder to park than a small car moving at the same speed.

.....

4 what can be observed when (what happen if)

Unit 1

1. Adding water to concentrated sulphuric acid.
.....
2. If the energy required to break the bonds in a reaction exactly equal to the energy released when the bonds were formed?
.....
3. Thermometer reading when : ammonium chloride powder dissolves in water, magnesium strip reacts with hydrochloric acid?
.....
4. Passing a stream of air over red-hot copper powder.
.....
5. Passing a stream of hydrogen gas over black copper oxide with heating.
.....
6. Evacuating air from food preservation bags.
.....
7. Extinguish sodium or potassium fires with water.
.....
8. Dipping two rods of copper and zinc into two lemons and connect them to LED bulb.
.....
9. Increasing the bond energy in the reactant molecules relative to their case of breakage.
.....
10. A chemical reaction occurs in which the energy released during bond formation is "less" than the energy absorbed to break the bonds.
.....
11. Adding aluminum oxide powder to iron oxide (thermite reaction).
.....

12. Decreased amount of oxygen during the combustion of a benzene flame.

.....

13. Add drops of glycerin to potassium permanganate powder.

.....

14. Placing a piece of steel wool wire on fire in a laboratory with pure oxygen.

.....

Unit 2

15. If no force affects on a stationary object

.....

16. If a constant force affects on an object in relation to its acceleration of motion

.....

17. A person pushing a heavy vehicle

.....

18. Elastic collision between two objects

.....

19. The collision of two objects is an inelastic collision

.....

20. All the forces acting on an object moving at a constant speed stopped.

.....

21. If the effective force increases when pushing a box on a smooth surface relative to the acceleration

.....

22. If a small car collides with a big car with a low speed (in terms of kinetic energy)

.....

23. If the driver presses the brakes of a car that is moving at a constant speed suddenly relative to the passengers

.....

24. When a person jumps in a boat that is on the surface of the water

.....

25. The resulting force acting on an object if it is exerted by two forces of equal in magnitude and opposite in direction?

.....

26. The distance covered by the truck to stop when the brakes are pressed if its load (mass) increases?

.....

27. Pulling quickly a tablecloth from under food plates?

.....

28. Increasing both the net force acting on the object and its mass to double.

.....

29. To the acceleration of a moving object when its mass increases while the force acting on it remains constant?

.....

30. When two equal-mass objects, moving at the same velocity in opposite directions collide with each other?

.....

31. when an elastic collision occurs between two identical balls, one is moving and the other is stationary?

.....

32. Which takes less time to stop when applying the brakes: A truck or a car moving at the same velocity?

.....

5 Answer the following

Unit 1

1- If the initial temperature $T_1 = 20^\circ\text{C}$ and the final temperature $T_2 = 15^\circ\text{C}$, calculate :

- The change in temperature ΔT and determine the type of dissolution.

.....

2- List three examples of substances that dissolve in water and represent exothermic dissolution.

.....

3- List three examples of substances that dissolve in water and represent endothermic dissolution.

.....

4- Mention the names of the processes of matter transformation, then specify whether they are exothermic or endothermic.

.....

5- What is the role of citric acid in lemons when making a battery?

.....

6- Hydrogen gas reacts with chlorine gas, according to the following thermochemical equation :



(1) Is this reaction exothermic or endothermic? Explain your answer.

.....

(2) Which is greater: The energy absorbed during breaking bonds or the energy released during forming new bonds?

.....

7- Write the thermochemical equation expressing the thermite reaction, then mention the importance of this reaction.

.....

8- Ammonia burns completely in excess of oxygen gas according to the following balanced equation :



(1) Identify the substances that undergo oxidation and those that undergo reduction.

.....

(2) What is the reducing agent in this reaction?

.....

(3) Write a balanced equation for the incomplete combustion of ammonia.

.....

9- How can understanding of oxidation and reduction help in preservation of food?

.....

Unit 2

10- Is water or sand used to extinguish sodium fires?

.....

11- What makes a ball rolling on the ground gradually stop?

.....

12- When pulling the rope between two groups which the force does each team feel?

.....

13- A rocket that goes forward when the gas exits backwards. This is explained by Newton's third law

.....

14- illustrates inertia : Give an example from your daily life

.....

15- An object with a mass of 5 kg is affected by a force of 20 newtons Calculate the acceleration

.....

16- What happens to the acceleration if the mass doubles as the force is constant ?

.....

17- What is the mathematical relationship between force and acceleration ?

.....

18- A car gains more speed when the engine power increases. What law makes this clear?

.....

19- Mention an example from daily life that illustrates Newton's third law?

.....

20- If a light ball is replaced by another heavy one, which the ball will be affected more ? why?

.....

21- A person pushes the wall, why doesn't the wall move despite the pushing?

.....

22- A car moving at a constant speed on a straight road Which law explains this ?

.....

23- When jumping out of the boat, the boat moves backwards Which law makes this clear?

.....

24- Calculate the acceleration at which a car of mass 1000 kg moves when the engine force is 1300 N (Ignoring friction force affecting the car).

.....

25- A person pulled a 10 kg block box with a force of 50 N on a horizontal frictionless surface. How much acceleration does the box move?

.....

26- An object with a mass of 15 kg is placed on the ground. How much force is needed to lift it vertically? (Note that the acceleration of gravity = 10 m/s^2)

.....

27- Mention four characteristics that describe the two forces mentioned in Newton's third law.

.....

6 Mark (✓) or (X) for each statement, with correction

Unit 1

1. Butagas is a mixture of methane and propane gases. ()
2. Nitrogen gas is described as the fuel of the future. ()
3. Bunsen flame changes colour according to the amount of oxygen mixed with the fuel. ()
4. The oxidizing agent undergoes a reduction process. ()

Unit 2

5. The action and the reaction affect the same body ()
6. The forces of action and reaction are equal in magnitude ()
7. The forces of action and reaction are opposite in the direction ()

7 What is the use of each of the following

Unit 1

1. Refrigeration cycle in the refrigerator
-

2. Polystyrene cups

.....

3. Instant cold compresses

.....

4. Instant hot compresses

.....

5. Exothermic reactions for some types of insects

.....

6. Self-heating cans

.....

7. The thermite reaction

.....

8. Ethyl alcohol (ethanol)

.....

9. Fuel of the future

.....

10. Natural gas and butagas

.....

11. Ethanethiol gas

.....

12. The flame of Bunsen burner

.....

13. Sparks plugs (Bougies)

.....

14. Oxyacetylene flame

.....

15. Fire extinguishers

.....

16. Sand in laboratories

.....

17. Closing gas valves during fires

.....

18. Newton meter (Spring balance)

.....

19. Cruise control

.....

20. The seat belt

.....

21. The airbag

.....

8 Choose the correct answer

Unit 1

1- The correct definition of endothermic dissolution is

- (A) A process in which thermal energy is absorbed from the surrounding environment.
- (B) A process in which no exchange of thermal energy occurs.
- (C) A process in which chemical energy is converted into thermal energy.
- (D) A process in which thermal energy is released into the surrounding environment.

2- A common example of endothermic dissolution is

- (A) the dissolution of sodium carbonate
- (B) dissolving (NH_4NO_3) in water
- (C) the dissolution of sodium hydroxide
- (D) the dissolution of calcium chloride

3- A common example of exothermic dissolution is

- (A) Dissolving potassium sulphate.
- (B) Dissolving ammonium nitrate (NH_4NO_3) in water.
- (C) Dissolving sodium hydroxide.
- (D) Dissolving (NaHCO_3)

4- When instant cold compresses are used, it works by the blood vessels in the affected area, which leads to reduced blood flow and reduced swelling.

- (A) Widening (B) narrowing (C) Heating (D) Dissolving

5- Raise the temperature of the water when dissolved in it.

- (A) Ammonium nitrate. (B) Potassium chloride.
(C) Sodium hydroxide. (D) Hydrated copper sulfate.

6- In exothermic reactions, the final temperature (T_2) is the initial temperature (T_1)

- (A) Lower than (B) higher than (C) equal to (D) half

7- When a magnesium strip reacts with dilute hydrochloric acid, heat is transferred from

- (A) The surrounding medium to the system
(B) The system to the surrounding medium
(C) The products to the reactants
(D) The beaker to the thermometer only

8- Which of the following reactions is an example of an endothermic reaction ?

- (A) Magnesium reacting with hydrochloric acid
(B) Calcium oxide reacting with water
(C) Barium hydroxide reacting with ammonium chloride
(D) Thermite reaction

9- The German scientist who proved that energy cannot be created or destroyed is :

- (A) Einstein (B) Newton (C) Hermann von Helmholtz (D) Dalton

10- The process of breaking the bonds between atoms in reacting substances is :

- (A) Exothermic (B) endothermic
(C) Not accompanied by heat change (D) produces electrical energy

11- In the energy diagram of an exothermic reaction, the energy level of the products is..... the energy level of the reactants.

- (A) Higher than (B) lower than (C) equal to (D) parallel to

12- The substance is used in self-heating packages.

- (A) Ammonium chloride (B) Calcium oxide (quicklime)
(C) Sodium bicarbonate (D) Ammonium nitrate

13- The substance responsible for the "refreshing sensation" (coolness) when eating fizzy sweets is

- (A) Citric acid only (B) Glucose
(C) A mixture of sodium bicarbonate and citric acid (D) Iron oxide

14- The thermite reaction is used in

- (A) Cooling drinks (B) welding railroad tracks
(C) Making lemon batteries (D) making candy

15- In the lemon battery experiment, energy is converted from energy to electrical energy.

- (A) Thermal (B) kinetic (C) chemical (D) light

16- When ammonium chloride powder is added to barium hydroxide and the mixture is stirred, we observe

- (A) The temperature of the beaker rises.
(B) The mixture ignites.
(C) The temperature of the beaker drops and a layer of frozen water forms.
(D) No change occurs.

17- The correct equation for the reaction of quicklime with water is

- (A) $\text{Ca O} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + \text{heat}$ (B) $\text{Ca CO}_3 \rightarrow \text{Ca O} + \text{CO}_2$
(C) $2\text{Mg} + 2\text{HCl} \rightarrow \text{Mg Cl}_2 + \text{H}_2$ (D) $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$

18- In an endothermic reaction, the value of the change in heat content is

- (A) Negative (B) positive (C) zero (D) variable

19- The thermal change resulting from the melting of a certain amount of solute in a known volume of solvent to form a solution is called

- (A) Activation energy. (B) enthalpy of the material.
(C) Heat of dissolution. (D) Specific heat.

20- Which of the following material transformations is considered "exothermic"?

.....

- (A) Fusion. (B) Evaporation. (C) Sublimation. (D) Freezing.

21- When a crystalline (hydrated) salt such as $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ is dissolved in water, the color turns into

- (A) White. (B) Pink. (C) Blue. (D) The color does not change.

22- In the cooling cycle inside the refrigerator at any stage the heat is "absorbed" from the food

- (A) During the process of compressing the gas by the motor.
 (B) While the coolant is expanding and evaporating inside the refrigerator.
 (C) While the gas is condensing in the grid behind the refrigerator.
 (D) During the transfer of heat to the surrounding medium (air).

23- Using the following thermal equation :



Which of the following statements is true regarding this reaction?

- (A) Used in the manufacture of instant refrigeration packaging.
 (B) The final temperature of T_2 is lower than the primary T_1 .
 (C) The energy released when the bonds are formed is greater than the energy absorbed to break them.
 (D) The reaction represents the pyrolysis of the material.

24- The combustion process is based on 3 basic elements called "fire represented". Which of the following represents these elements from

- (A) Fuel, nitrogen gas, heat. (B) Fuel, oxygen gas, heat.
 (C) Carbon dioxide, fuel, oxygen. (D) Water, heat, oxygen.

25- According to the chemical reaction $\text{CuO} + \text{H}_2 \xrightarrow{\Delta} \text{Cu} + \text{H}_2\text{O}$.

Which substance is considered the reducing agent

- (A) Copper oxide (CuO). (B) Copper (Cu).
 (C) Hydrogen gas (H_2). (D) Water vapor (H_2O).

26- It is completely forbidden to use water to extinguish sodium or potassium fires in laboratories

- (A) Because water evaporates quickly.
- (B) Because water freezes when it comes into contact with these metals.
- (C) Because the reaction with water is highly exothermic and leads to the ignition of the rising hydrogen gas.
- (D) Because the density of water is less than that of sodium.

27- When the amount of oxygen is abundant (too sufficient) in a gasoline stove, the flame appears in colour.

- (A) Yellow.
- (B) Red.
- (C) Blue (complete combustion).
- (D) Orange.

28- A small percentage of ethanethiol gas is added to the natural gas used in households

- (A) To raise the calorific value of natural gas when it is combusted.
- (B) to act as a catalyst that increases the speed of natural gas combustion.
- (C) To facilitate the detection of gas leaks due to its characteristic garlic-like smell.
- (D) To reduce carbon dioxide emissions from combustion.

29- When a stream of hydrogen gas is passed over the heated black copper oxide powder

- (A) The tube explodes due to the rise of oxygen gas.
- (B) No reaction occurs because hydrogen is an inert gas.
- (C) Hydrogen oxide is formed and the powder turns into red copper.
- (D) The colour of the powder changes from black to white.

30- Ethanol prepared from cornstarch is a fuel, while hydrogen is a fuel.

- (A) Artificially / Biologically
- (B) Fossil / Naturally
- (C) Biologically / Artificially
- (D) Solid / Liquid

31- is the substance that gives oxygen during a chemical reaction."

- (A) Combustible material
- (B) Catalyst
- (C) Biofuel
- (D) Oxidizing agent

32- Water is not used to extinguish oil fires because

- (A) The density of oil is lower than that of water, so it floats on its surface and remains burning.
- (B) The water cools the petroleum quickly, causing it to freeze.
- (C) Water chemically reacts with petroleum and produces toxic gases.
- (D) Water hydrolyses by heat into oxygen that increases the ignition of a fire.

33- Which is the substance that changes colour from blue to pink when drops of water are added to it?

- (A) Anhydrous cobalt chloride.
- (B) Anhydrous copper sulphate.
- (C) Hydrated cobalt chloride.
- (D) Hydrated copper sulphate.

34- What change occurs in all endothermic processes?

- (A) A change in the solution colour.
- (B) Solid substances melt.
- (C) A gas evolves.
- (D) The temperature of the surrounding medium decreases.

35- The dissolution of the following substances in water is accompanied by the release of thermal energy, except

- (A) Sodium hydroxide.
- (B) Calcium chloride.
- (C) Sodium carbonate.
- (D) Sodium bicarbonate.

36- The dissolution of which of the following substances in water leads to a chemical change accompanied by the release of thermal energy?

- (A) Sodium hydroxide.
- (B) Calcium oxide.
- (C) Sodium carbonate.
- (D) Sodium chloride.

37- Each of the following represents an element of the fire triangle, except

- (A) heat.
- (B) water.
- (C) fuel.
- (D) Oxygen.

38- Which fuel of the following has the highest calorific value?

- (A) Natural gas.
- (B) Ethanol.
- (C) Hydrogen.
- (D) Wood.

39- Which of the following describes the reaction of potassium permanganate with glycerin?

- (A) Endothermic and spontaneous ignition reaction.
- (B) Exothermic and spontaneous ignition reaction.
- (C) It occurs by heating although it is exothermic.
- (D) It occurs by cooling although it is endothermic.

40- A net force of 1 N means an object of mass 1 kg is

- (A) moving at an acceleration of 10 m/s^2
- (B) moving at an acceleration of 1 m/s^2
- (C) lifted vertically at a velocity of 1 m/s .
- (D) lifted vertically at a velocity of 10 m/s

Unit 2

41- Which of the following did Newton discover?

- (A) Electricity
- (B) Gravity
- (C) Nuclear Forces
- (D) Laws of Electromagnetism

42- Which of Newton's laws explains the relationship between force, mass, an acceleration?

- (A) First Law
- (B) Second Law
- (C) Third Law
- (D) Law of Attraction

43- Why is Newton considered one of the greatest scientists?

- (A) Because he invented electricity
- (B) because he contributed to physics and mathematics
- (C) Because he discovered penicillin
- (D) because he invented the airplane

44- An object moves at an acceleration (a), if the object mass is halved and the net force acting on it is doubled, its acceleration of motion will be

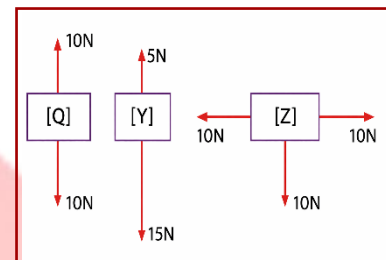
- (A) a
- (B) 2 a
- (C) 3 a
- (D) 4 a

45- Which of the following bodies has the greatest inertia?

- (A) A ball of mass 0.1 kg moving at velocity 50 m/s
- (B) A runner of mass 70 kg moving at velocity 30 m/s
- (C) A car of mass 1000 kg moving at velocity 50 m/s
- (D) A van of mass 2000 kg moving at velocity 30 m/s

46- The opposite figures show three objects X, Y, Z each object is affected by several forces :

Which object is affected by a non-zero net force (unbalanced forces)?



(A) Objects X, Y, Z

(B) Object X only.

(C) Objects Y and Z only.

(D) Object Y only.

47- Launching a rocket in a direction opposite to that of the expelled gases is explained by

(A) Newton's first law.

(B) Newton's second law.

(C) Newton's third law.

(D) law of universal gravitation.

9

Define the following (what is meant by)

Unit 1

Refrigeration cycle in the refrigerator	.....
Heat of dissolution	.....
Exothermic dissolution	.....
Endothermic dissolution	.....
Law of conservation of energy	.....
Exothermic reactions	.....
Endothermic reactions	.....

Fuel	.....
Calorific value of fuel	.....
Combustion	.....
Ignition point	.....
Spontaneous combustion	.....
Oxidation process	.....
Reduction process	.....
Reducing agent	.....
Oxidizing agent	.....
Net force	.....
Newton's first law (Law of inertia)	.....
Stopping time	.....
Stopping distance	.....
Acceleration (a)	.....
Newton's second law	.....
Newton's third law Newton's laws	.....

Unit 2

10 compare between each of the following

Unit 1

- 1- Exothermic process and Endothermic process
- 2- Instant hot compresses (Packs) and Instant cold compresses (Packs)

- 3- Exothermic reactions and Endothermic reactions
- 4- Fossil fuel, Biofuel and Synthetic fuel
- 5- The fire triangle (Combustion triangle) and The extinguishing fire triangle
- 6- Oxidation process and Reduction process
- 7- Reducing agent and Oxidizing agent
- 8- Elastic collision and Inelastic collision

11 Correct the following statements

Unit 1

- 1- In exothermic reactions, the final temperature T_2 is lower than the initial temperature T_1 .
.....
- 2- The CaCO_3 decomposition reaction is an example of exothermic reactions.
.....
- 3- The less energy the bond, the harder it is to break.
.....
- 4- In an endothermic reaction, the system absorbs heat energy that causes the increase in the temperature of the surrounding medium
.....
- 5- Self-heating packaging is based on the reaction of calcium oxide with water, which is an endothermic reaction.
.....
- 6- Natural gas is mainly made up of propane gas
.....
- 7- Oxidation is a process that results in a lack of oxygen in a material.
.....
- 8- A reducing agent is defined as the substance that gives oxygen during a reaction.
.....
- 9- The calorific value of wood is higher than the calorific value of hydrogen.
.....

Unit 2

10- The acceleration with which the object moves increases as its mass increases when the force is constant.

.....

11- The forces of action and reaction affect on the same body and therefore do not cancel each other out.

.....

12- Newton's second law is known as the law of inertia.

.....

13- If two forces of equal magnitude and opposite in direction act along same line of action, the resultant is the sum of the two forces.

.....

14- Mass is considered a vector physical quantity.

.....

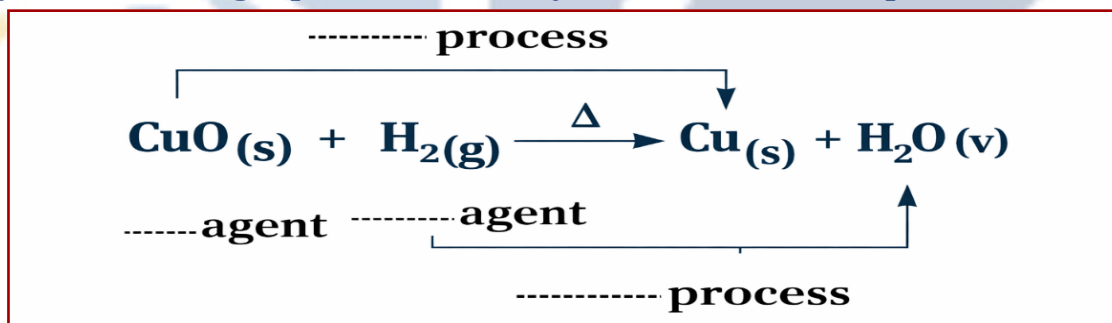
12 Various questions

Unit 1

1. The combustion triangle consists of :

1- 2- 3-

2. Study the following equation carefully, then answer the question:



Complete the data on the previous equation :

1. Oxidized to increase the oxygen content is

2. CuO Called by agent because

3. It reduced to decrease the amount of

4. H_2 Called by agent because

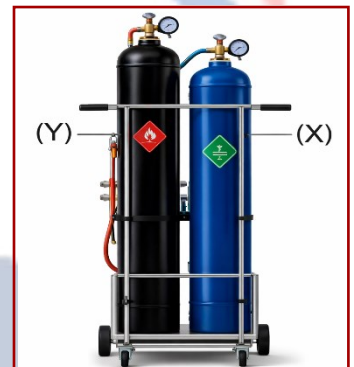
3. Technology of food preservation by air evacuation

Evacuating air from food packing creates a low which reduces and reactions which lead to spoiling of



4. Draw the energy diagram for an endothermic reaction.

5. The figure shows a cylinder (X) containing a compressed gas that helps burning, and a cylinder (Y) containing a compressed flammable gas. Their mixture can produce a flame used in welding metals :



(1) Name the gases in cylinders (X) and (Y).

(2) What is the name of the flame produced? What is its temperature?

Unit 2

6. The figure in front of you is a ball rolling on a rough ground and then stopping after a distance.

1- What is the reason for the ball stopping?

2- What is the name of the force acting on the ball?

3- Can an object be moving and stationary at the same time? Illustrate your answer with an example from everyday life

4- What happens to the motion of the ball if the rough surface is replaced by a smooth surface?



7. Look at the picture in front of you Then answer the following :

1- Determine the direction of each force acting on the vehicle (use arrows)

.....

2- Calculate the net force if each force is 50 newtons.

.....

3- Does the car move or remain stationary? With the explanation? and if it moves, what is the direction of its movement?

.....

4- Choose the correct answer : the net force is

- (A) The greatest force acting on the body
- (B) The sum of the forces acting on the body
- (C) The sum of the masses acting on the body
- (D) The sum of the forces acting on a same line of action



8. Types of Forces :

Choose the appropriate type of force for each of the following images (Push-Pull)



(.....)



(.....)



(.....)



(.....)

9. Balanced and unbalanced forces



(.....)



(.....)

1. What happens if two tug-of-war teams are equal in force?

.....

2- How do you know if a rope is moving due to an unbalanced force?

.....

3-What is the relationship between the number of players or the force they exert on the movement of the rope?

.....

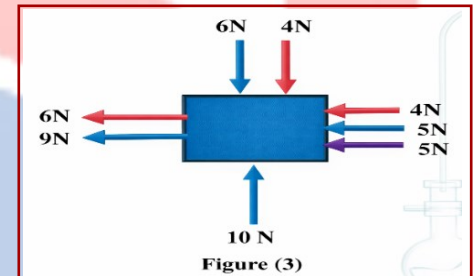
10. The figure (3) in front of you shows a stationary object : that is affected by a set of forces

a) Calculate the net forces

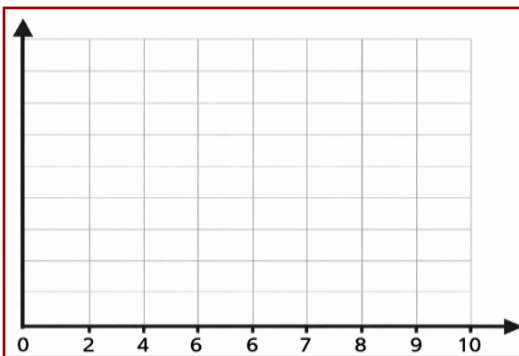
.....

b) Does the object remain stationary or will it move? mentioning the reason

.....



11. Draw the following graph from the following table :



Force	Acceleration
2	1
4	2
6	3
8	4
10	5

-From the graph :

1- Calculate the object's mass?

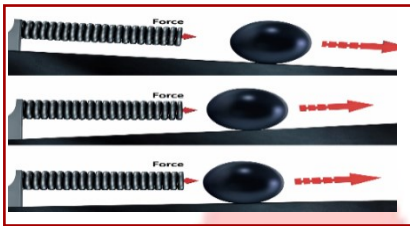
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2- Determine the independent factor, the dependent factor and the control factor

.....

مراجعات النخبة

12. Notice the following set of images and then select which of Newton's laws applies to them?



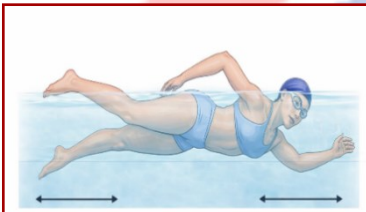
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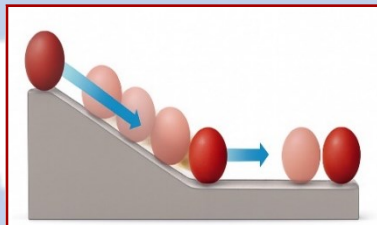
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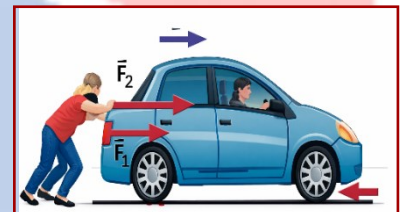
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(.....)



(.....)



(.....)



(.....)

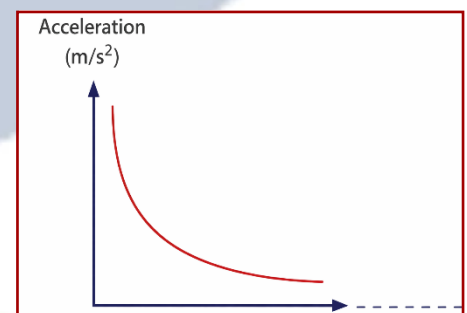


(.....)

13. Based on your understanding of Newton's second law:

What does the horizontal axis represent in the given graph?

.....



1 Write down what the following sentences mean**Unit 1**

1. Reactions that require the absorption of thermal energy from the surrounding environment, causing its temperature to decrease. endothermic reaction
2. Energy cannot be created or destroyed, but it can be converted from one form to another. law of energy conservation
3. A diagram showing the path and changes of energy during a chemical reaction from reactants to products. energy diagram
4. A chemical reaction that results in the release of heat energy from the reaction products to the surrounding environment. exothermic reaction
5. A chemical process in which the bonds in the molecules of the reactants are broken and new bonds are formed in the molecules of the products. chemical reaction
6. The name given to the calcium hydroxide produced by the reaction of quicklime with water limewater
7. An isolated system in which the total energy remains constant (as defined by Helmholtz). law of energy conservation
8. A closed and repeated thermal process, in which heat is withdrawn from inside the refrigerator to the outside, using eco-friendly freons. Refrigeration cycle in the refrigerator.
9. The refrigerator coolant liquid. Eco-friendly freons.
10. The amount of heat absorbed or released when dissolving a specific quantity of solute in a known volume of solvent to form a solution. Heat of dissolution.
11. Dissolution accompanied by a rise in the temperature of the surroundings. Exothermic dissolution.
12. A physical change accompanied by the absorption of thermal energy from the surroundings when a substance dissolves in water. Endothermic dissolution.
13. Substances whose molecules are linked to a specific number of water molecules through an exothermic process. Hydrated substances.
14. A salt whose colour changes from blue to pink when drops of water are added to it. Anhydrous cobalt chloride salt.

15. Compresses used only once, in which endothermic or exothermic dissolution occurs. Instant cold and hot compresses (Packs).
16. Energy is neither destroyed nor created, but it is transformed from one form to another. Law of conservation of energy.
17. A scientist who explained that the total energy remains constant within the isolated system. Scientist Hermann Von Helmholtz.
18. Cans used for warming coffee or heating the food inside them. Self-heating cans.
19. The reaction of heating aluminum with red iron oxide. Thermite reaction.
20. A simple model that illustrates the three main elements of the combustion process. Fire triangle (combustion triangle).
21. Flammable materials used in the production of thermal energy as a result of the occurrence of an exothermic reaction. Fuel.
22. The non-renewable fuel which is the most used worldwide till now. fossil fuel
23. The amount of energy produced from the combustion of 1 g of fuel in excess oxygen gas. Calorific value of fuel
24. The combination of fuel with oxygen, accompanied usually by the emission of light, heat, or both. Combustion.
25. A flame produced from the ignition of a mixture of a gaseous fuel and oxygen. Bunsen flame.
26. The combustion of fuel in a limited amount of oxygen gas. Incomplete combustion.
27. The temperature at which fuel begins to ignite. Ignition point.
28. Ignition of materials without the presence of an external source of heat Spontaneous combustion.
29. A chemical process in which the percentage of oxygen increases in the substance or the percentage of hydrogen decreases in it. Oxidation process.
30. A chemical process in which the percentage of oxygen decreases in the substance or the percentage of hydrogen increases in it. Reduction process.
31. The substance that takes away oxygen or gives hydrogen during the chemical reaction. Reducing agent.

Unit 2

32. The substance that gives oxygen or takes away hydrogen during the chemical reaction. Oxidizing agent.
33. A scientist who believed that objects do not continue moving unless a force acts continuously on them. Aristotle.
34. A scientist who explained that objects tend to maintain their state of rest or motion unless acted upon by an external force. Galileo.
35. The total force in magnitude and direction resulting from the effect of a number of forces acting on an object. Net force.
36. The scientist who formulated the laws of motion and the universal law of gravitation. Isaac Newton.
37. object keeps its state of rest or motion at a constant velocity in a straight line, unless acted upon by external unbalanced forces that change its state. Newton's first law (Law of Inertia).
38. The time taken for the moving object to stop. Stopping time.
39. The distance travelled by the moving object during the stopping time. Stopping distance.
40. A device used to keep the velocity of cars constant on highways without direct driver intervention. Cruise control.
41. The change in the velocity of an object per unit time. Acceleration.
42. If a net force (F) acts on an object with a mass (m), it causes the object to have an acceleration (a) in the same direction as the net force. Newton's second law.
43. A safety device that works with the seat belt in the car to prolong the time of collision, and thus reduce the rate of change in velocity, which in turn minimizes the force of collision acting on the driver. Airbag.
44. For every action, there is an equal and opposite reaction. Newton's third law.
45. A collision between a stationary object and a moving object having the same mass and no loss of kinetic energy occurs. Elastic collision.
46. A collision between a stationary object and a moving object having the same mass in which kinetic energy is lost. Inelastic collision.

2 Complete the following sentences

Unit 1

1. The processes of material transformation and dissolution are physical accompanied by Processes that are absorbing or releasing energy from the surrounding medium.
2. Exothermic dissolution is accompanied by releasing such as sodium hydroxide NaOH and calcium chloride CaCl₂
3. Endothermic dissolution is accompanied by absorbing Such as Ammonium nitrate NH₄NO₃ and potassium sulphate K₂SO₄
4. The combination of molecules of some substances with a specific number of water molecules. These substances are called hydrated salt and if the water molecules are removed by heating, the molecules are called anhydrous salt
5. The color of hydrated copper sulphate is blue while the anhydrous copper sulphate is white
6. Instant Hot compresses help relieving the pain of muscle strain while Instant cold compresses are used in cases of swelling.
7. The color of hydrated cobalt chloride is pink , while the anhydrous cobalt chloride is blue
8. When the released energy from combination of solute with solvent is greater than the absorbed energy , the solubility is exothermic
9. Ammonium nitrate (NH₄NO₃) is used in cold instant pressure compresses because its dissolution in water is an endothermic process.
10. Doubling the mass of the solute leads to increase in the amount of change in the temperature of the solvent (water).
11. Substances that lower the temperature of water when dissolved (such as ammonium nitrate) are described as endothermic dissolving.
12. Examples of fuel include : fossil fuel and biofuel and synthetic fuel
13. Examples of fossil fuels include Oil and coal and natural gas
14. Butagas consists of two gases : Butane and propane
15. Ethanol is an example of bio fuel that is prepared from plants rich in starch such as corn.

16. Fuel begins to ignite when it reaches ignition point.
17. Highly flammable materials have a ignition point of low flammable while slow-materials have a ignition point of high
18. Fires can be extinguished by remove fuel or isolate oxygen or cooling
19. The oxyacetylene flame is produced by the complete combustion of acetylene gas in presence of O_2 gas and reaches a temperature of 3000 Celsius degrees.
20. Flammable Materials that have a low ignition point, while non-flammable materials that have a high ignition point.
21. Oxy-acetylene flame is produced by the complete combustion of acetylene gas in present of excess oxygen, reaching a temperature of 3000 °C
22. Oxidization process leads to shortage of hydrogen the percentage in the substance. While the reduction process causes an increase hydrogen percentage in the substance.
23. The oxidizing agent undergoes a process of reduction and the reducing agent undergoes a process of oxidation
24. In a chemical reaction, bond breaking is a endothermic process, while forming bonds is a exothermic process.
25. In the energy diagram of the endothermic reaction, the energy of the products is less than of the energy of the reactants.
26. The "thermit" reaction is used in welding railway tracks and it is exothermic reaction
27. In a lemon battery, chemical energy stored in lemon juice is converted to electrical energy
28. Newton's first law states that the object remains at rest or in uniform motion in a straight line unless an external force affects on it.
29. Force is anything that is capable of changing the motion (velocity) of the object.
30. Newton's second law states that the resulting force exerted on an object is equal to mass $\times$ acceleration.
31. If the force acting on an object is zero, then the velocity (speed) of the body does not change.

Unit 2

32. Newton's third law states that for every action there is an equal in **magnitude** and opposite in **direction**.
33. When you push a ball on a flat surface, the value of the acceleration with which it moves depends on the affecting **force** and **mass** of the ball.
34. If the force acting on an object increases and its mass remains constant, the **acceleration** of the object increases.
35. When you sit in a car that suddenly stops, your body leans forward due to **inertia**
36. Elastic collision is the collision that keeps both body's **kinetic energy** and body's **momentum or velocity**
37. In elastic collision between two objects, the relative velocity of the two objects after the collision is **equal to** their relative velocity before collision
38. In inelastic collision, a loss of energy occurs in the form of **heat** or **sound**
39. Air hockey is a fun game in which **two round paddles** is used Circular in the push of **light disc** It slides on a smooth table with holes through which a constant stream of air rushes to reduce **friction** between the disc and the table.
40. When balanced forces act on an object, the body **remains stationary or moves at constant velocity** While when unbalanced forces affect the same body it **accelerates**.
41. Unit of force measurement is **Newton (N)**, the speed measurement unit is **meter per second (m/s)** while the acceleration measurement unit is **meter per second squared (m/s²), N/kg**
42. If the resulting force is not equal to zero, so the force is **unbalanced**.
43. It is recommended to wear a **seatbelt** when driving a car.
44. **flyboard** allows the user to fly in the air upwards as the water rushes down through Its openings.
45. The property of the body's resistance to changing its dynamic state is known as **inertia**
46. **A drone** works by pushing air from the motors downwards, which is followed by pushing the air upwards with equal force.

3 Give reason for (scientific explanation) for each of the following

Unit 1

1) We feel cold when washing our hands with antiseptic hand gel :

Due to the absorption of heat from the hands when the alcohol present in the hand gel evaporates.

2) We feel the warmth of our hands when the laundry powder dissolves in water.

Due to releasing heat during dissolution of laundry powder in water

3) Special precautions must be taken when diluting concentrated acids by adding the acid to water, not the other way around.

Because when water is added to concentrated acid, a large amount of thermal energy is released, leading to violent instant boiling of the water and splashing of acid outside

4) Instant Hot packs (using magnesium sulfate) are used to relieve pain associated with muscle strain

Because they work by widening the blood vessels, which increases blood flow to the stressed areas, causing relaxing of the contracting muscles and relieving pain."

5) The mass of the dissolved substance is directly proportional to the change in temperature resulting from the melting process.

Because when mass of solute increases the change in temperature increases

6) You feel a cooling sensation in your mouth when you eat fizzy candy containing sodium bicarbonate

Due to absorbing heat from mouth (endothermic reaction)

7) The reaction of magnesium with hydrochloric acid is an exothermic reaction.

Due to release thermal energy to surrounding which increase its temp.

8) Water droplets at the bottom of the flask freeze when barium hydroxide reacts with ammonium chloride.

Due to absorbing thermal energy from surrounding leads to decrease its temperature and freeze of water

9) The use of thermite reaction in welding railroad tracks.

Because it is an exothermic reaction that results in the release of a significant amount of thermal energy, leading to melting iron which is produced from the reaction.



10) The difference in heat content between reactants and products in chemical reactions.

Due to the difference in energy between the bonds broken and the bonds formed during the reaction

11) A reaction is called exothermic if the energy released during bond formation is greater than the energy absorbed during bond breaking.

Because amount of released thermal energy is more absorbed energy

12) Scientists resort to using self-heating containers in expeditions or military applications.

Because an exothermic reaction occurs between calcium oxide and water, with releasing heat



13) Fireflies are called by this name (in relation to energy transformations).

Because exothermic chemical reactions in their body produce light

14) A small percentage of ethanethiol gas is added to both natural gas and Butagas
To take appropriate safety measures in case of gas leaks, as both are odourless and ethanethiol gas is characterized by a garlic smell.

15) Biofuel is prepared from corn plants

Because it is rich in starch

16) In some countries, biofuel is mixed with gasoline

To used as fuel for cars

17) The combustion of a piece of steel wool (scouring pad) in a cylinder containing pure oxygen is faster than its combustion in atmospheric air.

To increase the concentration of pure oxygen in the cylinder compared to its concentration in the air, and the rate of combustion increases with the increase in the percentage of oxygen gas.

18) The color of the Bunsen flame used in laboratories varies :

Due to the difference in the amount of oxygen mixed with the fuel

19) The Bunsen flame sometimes has a yellow flame and sometimes a blue flame:

According to amount of oxygen (limited so the flame turns yellow, or abundant when the air hole in the Bunsen turns blue)

20) Spark plugs are used in car engines :

To produce spark to ignite the mixture of gasoline and air in combustion chamber of car engine during starting

21) The combustion of carbohydrates produces CO_2 , H_2O : gas

Because they consist of carbon and hydrogen

22) An oxyacetylene flame is used for cutting or welding metals :

Because its temperature reaches 3000°C

23) Potassium permanganate powder reacts when drops of glycerin are added to it :

Due to spontaneous exothermic reaction produce smoke and purple flame

24) Extinguishing sodium or potassium fires with water is strictly prohibited.

Because it increase fire and react with water in exothermic reaction and produce H_2 gas

25) Water is not used to extinguish petroleum fires

Because petroleum oil floats on the surface of water due to its lower density compared to that of water, which leads to the spread of fires instead of extinguishing them.

26) Water is used to extinguish most fires

Because of the high specific heat of water, which makes it absorbs a large amount of thermal energy and thus the temperature of the burning materials decreases.

27) Red-hot copper is oxidized when a stream of air passed over it.

Because percent of oxygen increase and Change to CuO

28) Black copper oxide is reduced when a stream of hydrogen gas passed over it.

Because hydrogen takes the oxygen away from the copper oxide to form water vapor, leaving behind red copper.



29) Food can be preserved by evacuating air from preservation bags.

Because this provides a low-oxygen environment, which reduces oxidation and reduction reactions that lead to spoiling of food.

30) The substance that happened to oxidation process is called the reducing agent

Because it take oxygen from Other Substance and give H_2

- 31) The stationary body remains stationary if it is not affected by force
Due to Newton's First Law (Law of Inertia) An object at rest stays at rest unless acted upon by an external force.
- 32) Water spilling from the cup if the cup is moved suddenly
Because the inertia of water causes it to resist the sudden movement
- 33) Pushing of an empty cart requires less force than pushing a full cart
Due to Newton's Second Law ($F = m \times a$), Greater mass requires greater force to produce the same acceleration
- 34) Increasing the acceleration the greater the force exerted on the body
Due to acceleration is directly proportional to the net force when mass is constant
- 35) The boat moves backwards when you jump from it towards the shore
Because the movement of the boat represents the reaction to the force of person jumping (action), and they act in opposite directions without any time difference.
- 36) A moving ball stops when it hits a wall
Because The ball exerts force on the wall (action), and the wall exerts an equal and opposite force back on the ball (reaction), stopping it
- 37) A ball bounces from another ball when it collides
Due to Each ball exerts an equal and opposite force on the other, causing them to bounce apart.
- 38) In elastic collisions, there is no loss of kinetic energy
Because in elastic collision the velocity doesn't change before or after collision
- 39) In inelastic collisions, there is a loss of kinetic energy
Because There is a loss of energy in the form of heat, sound, or deformation of the shape of the object.
- 40) The passengers of the bus rush forward when it comes to a sudden stop.
Because the inertia of the passenger causes him to resist the sudden change in their state of motion when pressing the brake (the brake pedal) to keep the state of motion they were in.
- 41) The static bag on the counter remains at rest unless affected by an external force.
Because a stationary object remains stationary unless acted upon by external unbalanced forces that change its state, according to Newton's first law (Law of Inertia).

42) A large truck loaded with goods is harder to park than a small car moving at the same speed.

Because as the mass of the object increases, its inertia increases, making it more difficult to stop.

4 what can be observed when (what happen if)

Unit 1

1. Adding water to concentrated sulphuric acid.

release large amount of heat causing boiling of water and splashing of acid outside container causing damage

2. If the energy required to break the bonds in a reaction exactly equal to the energy released when the bonds were formed?

there isn't released or absorbed energy to or from surrounding so its temp not change

3. Thermometer reading when : ammonium chloride powder dissolves in water, magnesium strip reacts with hydrochloric acid?

The thermometer reading decreases because the first reaction is endothermic then it increase because the second reaction is exothermic

4. Passing a stream of air over red-hot copper powder.

Copper combines with oxygen of atmospheric air forming black copper oxide compound



5. Passing a stream of hydrogen gas over black copper oxide with heating.

Reddish-brown copper is formed



6. Evacuating air from food preservation bags.

It preserve food for long time as it decrease oxidation and reduction

7. Extinguish sodium or potassium fires with water.

The fire will increase because Sodium will react with water and form H_2 gas that increases fire.

8. Dipping two rods of copper and zinc into two lemons and connect them to LED bulb.

The LED bulb lights up because the lemon acts as a battery, converting chemical energy into electrical energy. The citric acid in the lemon acts as an electrolyte.

9. Increasing the bond energy in the reactant molecules relative to their case of breakage.

The reaction becomes harder to occur because more energy is needed to break the stronger bonds.

10. A chemical reaction occurs in which the energy released during bond formation is "less" than the energy absorbed to break the bonds.

The endothermic reaction will be occur

11. Adding aluminum oxide powder to iron oxide (thermite reaction).

A highly exothermic reaction occurs, releasing a large amount of heat and light, producing molten iron and aluminum oxide.

12. Decreased amount of oxygen during the combustion of a benzene flame.

Incomplete combustion occurs, and the flame becomes yellow colour.

13. Add drops of glycerin to potassium permanganate powder.

A spontaneous exothermic reaction occurs, leading to the emission of smoke with the formation of a purple-coloured flame.

14. Placing a piece of steel wool wire on fire in a laboratory with pure oxygen.

The steel wool burns very fast producing a large amount of heat and light

Unit 2

15. If no force affects on a stationary object

The object remains stationary due to Newton's First Law (Inertia).

16. If a constant force affects on an object in relation to its acceleration of motion

The object moves with constant acceleration due to Newton's Second Law ($F = ma$)

17. A person pushing a heavy vehicle

The vehicle exerts an equal and opposite force back on the person Due to Newton's Third Law.

18. Elastic collision between two objects

There is no loss in kinetic energy

19. The collision of two objects is an inelastic collision

There is loss in kinetic energy in the form of heat or sound

20. All the forces acting on an object moving at a constant speed stopped.

The object continues moving at the same constant speed due to Newton's First Law.

21. If the effective force increases when pushing a box on a smooth surface relative to the acceleration

The acceleration increases according to Newton's Second Law

22. If a small car collides with a big car with a low speed (in terms of kinetic energy)

The small car loses more kinetic energy and bounces back harder.

23. If the driver presses the brakes of a car that is moving at a constant speed suddenly relative to the passengers

The passengers will move forward due to inertia.

24. When a person jumps in a boat that is on the surface of the water

The boat moves backwards while the person jumps forward.

25. The resulting force acting on an object if it is exerted by two forces of equal in magnitude and opposite in direction?

The net force = zero, object remains at rest or moves at constant speed.

26. The distance covered by the truck to stop when the brakes are pressed if its load (mass) increases?

The stopping distance increases because greater mass requires greater force to stop.

27. Pulling quickly a tablecloth from under food plates?

The plates remain in place due to inertia

28. Increasing both the net force acting on the object and its mass to double.

Acceleration remains the same because ($a = F/m \rightarrow 2F/2m$)

29. To the acceleration of a moving object when its mass increases while the force acting on it remains constant?

The acceleration of the object's motion decreases.

30. When two equal-mass objects, moving at the same velocity in opposite directions collide with each other?

They will both move in the opposite direction and at the same velocity, as they acquire acceleration in the same direction as the force acting on each of them.

31. when an elastic collision occurs between two identical balls, one is moving and the other is stationary?

They are affected by two forces equal in magnitude and in opposite directions, so the moving object stops and the stationary object moves at the same velocity as the moving object before the collision.

32. Which takes less time to stop when applying the brakes: A truck or a car moving at the same velocity?

The car / Because its mass is the least, and the less the mass of the object, the less its inertia and thus it is easier to stop, so it takes less time to stop.

5 Answer the following

Unit 1

1- If the initial temperature $T_1 = 20^\circ\text{C}$ and the final temperature $T_2 = 15^\circ\text{C}$, calculate :

- The change in temperature ΔT and determine the type of dissolution.

$$t = 15 - 20 = -5^\circ\text{C} \quad \text{endothermic}$$

2- List three examples of substances that dissolve in water and represent exothermic dissolution.



3- List three examples of substances that dissolve in water and represent endothermic dissolution.



4- Mention the names of the processes of matter transformation, then specify whether they are exothermic or endothermic.

Endothermic : melting – evaporation – sublimation

Exothermic : freezing – condensation – deposition

5- What is the role of citric acid in lemons when making a battery?

store chemical energy which changes into electric energy

6- Hydrogen gas reacts with chlorine gas, according to the following thermochemical equation :



(1) Is this reaction exothermic or endothermic? Explain your answer.

Exothermic reaction / Because it is accompanied by the release of thermal energy as a product of the reaction to the surroundings.

(2) Which is greater: The energy absorbed during breaking bonds or the energy released during forming new bonds?

The energy released during forming new bonds is the greatest.

7- Write the thermochemical equation expressing the thermite reaction, then mention the importance of this reaction.



The importance of the reaction : It is used in welding the railway tracks.

8- Ammonia burns completely in excess of oxygen gas according to the following balanced equation :



(1) Identify the substances that undergo oxidation and those that undergo reduction.

- An oxidation process occurs to ammonia gas (NH₃).
- A reduction process occurs to oxygen gas (O₂).

(2) What is the reducing agent in this reaction?

Ammonia gas (NH₃).

(3) Write a balanced equation for the incomplete combustion of ammonia.



9- How can understanding of oxidation and reduction help in preservation of food?

Food is preserved by vacuuming the air because this provides a poor-oxygen environment, which minimizes the redox reactions that lead to spoiling of food.

10- Is water or sand used to extinguish sodium fires?

Sand / Because water increases the intensity of the fire instead of extinguishing it as a result of sodium reacting with water in an exothermic reaction accompanied by the ignition of the released hydrogen.

Unit 2

11- What makes a ball rolling on the ground gradually stop?

Friction between the ball and the ground acts as an opposing force that gradually slows down and stops the ball.

12- When pulling the rope between two groups which the force does each team feel?

Each team feels an equal and opposite force from the other team — Newton's Third Law.

13- A rocket that goes forward when the gas exits backwards. This is explained by Newton's third law

Because gas exiting backwards (action) pushes the rocket forward (reaction)

14- illustrates inertia : Give an example from your daily life

When a bus stops suddenly, passengers move forward because their bodies tend to continue moving.

15- An object with a mass of 5 kg is affected by a force of 20 newtons Calculate the acceleration

$$a = F \div m \quad a = 20 \div 5 \quad a = 4 \text{ m/s}^2.$$

16- What happens to the acceleration if the mass doubles as the force is constant ?

Acceleration decreases to half because $a = F/m \rightarrow F/2m = a/2$.

17- What is the mathematical relationship between force and acceleration ?

$$F = m \times a$$

18- A car gains more speed when the engine power increases. What law makes this clear?

Newton's Second Law — increasing force while mass remains constant increases acceleration.

19- Mention an example from daily life that illustrates Newton's third law?

When you swim, you push water backwards (action), and the water pushes you forward (reaction).

20- If a light ball is replaced by another heavy one, which the ball will be affected more ? why?

The lighter ball is affected more because it has less mass, so the same force produces greater acceleration ($a = F/m$).

21- A person pushes the wall, why doesn't the wall move despite the pushing?

Because the wall exerts an equal and opposite reaction force back on the person, and the wall is fixed to the ground so it cannot move.

22- A car moving at a constant speed on a straight road Which law explains this ?

Newton's First Law (Inertia) an object continues moving at constant speed unless acted upon by an external force.

23- When jumping out of the boat, the boat moves backwards Which law makes this clear?

Newton's Third Law — jumping forward (action) pushes the boat backwards (reaction).

24- Calculate the acceleration at which a car of mass 1000 kg moves when the engine force is 1300 N (Ignoring friction force affecting the car).

$$a = \frac{F}{m} = \frac{1300}{1000} = 1.3 \text{ m/s}^2$$

25- A person pulled a 10 kg block box with a force of 50 N on a horizontal frictionless surface. How much acceleration does the box move?

$$F = m \times a \quad a = F \div m$$

$$a = 50 \div 10 \quad a = 5 \text{ m/s}^2.$$

26- An object with a mass of 15 kg is placed on the ground. How much force is needed to lift it vertically? (Note that the acceleration of gravity = 10 m/s^2)

$$F = m \times a \quad F = 15 \times 10 \quad F = 150 \text{ N.}$$

27- Mention four characteristics that describe the two forces mentioned in Newton's third law.

(1) Equal in magnitude.

(2) Opposite in direction.

(3) They act without any time difference.

(4) They act on two different objects.

6 Mark (✓) or (X) for each statement, with correction

Unit 1

- Butagas is a mixture of methane and propane gases. (X) a mixture of propane and butane gases.
- Nitrogen gas is described as the fuel of the future. (X) Hydrogen
- Bunsen flame changes colour according to the amount of oxygen mixed with the fuel. (✓)

4. The oxidizing agent undergoes a reduction process. (✓)

Unit 2

- The action and the reaction affect the same body (✓)
- The forces of action and reaction are equal in magnitude (✓)
- The forces of action and reaction are opposite in the direction (✓)

7

What is the use of each of the following

Unit 1

Refrigeration cycle in the refrigerator	<u>Cooling the food inside the refrigerator by continuously transferring heat from inside the refrigerator to its outside</u>
Polystyrene cups	<u>They are used in thermal insulation.</u>
Instant cold compresses	<u>Compresses are used only once to reduce the severity of swelling.</u>
Instant hot compresses	<u>Compresses are used only once to relieve pain associated with muscles fatigue.</u>
Exothermic reactions for some types of insects	<u>Luminous insects use light as a result of exothermic reactions inside their bodies in various purposes such as mating and self-defense.</u>
Self-heating cans	<u>Warming coffee or heating the foods inside it without the need for an external heat source.</u>
The thermite reaction	<u>This reaction is used in welding the railway tracks.</u>
Ethyl alcohol (ethanol)	<u>It is used as fuel for cars in some countries after mixing it with gasoline.</u>
Fuel of the future	<u>It is used as fuel for cars and trucks powered by fuel cells (hydrogen fuel cells).</u>
Natural gas and butagas	<u>They are the main fuels used in households.</u>
Ethanethiol gas	<u>It is added with very small amount to natural gas and butagas to take the appropriate safety measures in case of gas leaks.</u>
The flame of Bunsen burner	<u>It is used as a source of heat in laboratories.</u>
Sparks plugs (Bougies)	<u>They produce a spark used to ignite the mixture of gasoline and air in the combustion chamber of the car engine during starting.</u>

Oxyacetylene flame	<u>It is used for cutting and welding metals, such as steel (iron) and copper.</u>
Fire extinguishers	<u>They are used to isolate fires from air (oxygen).</u>
Sand in laboratories	<u>It is used in extinguishing fires of some metals, such as sodium and magnesium fires.</u>
Closing gas valves during fires	<u>Fuel removal.</u>
Newton meter (Spring balance)	<u>It is used to measure the force.</u>
Cruise control	<u>Keeps the velocity of the cars constant on highways without any direct driver intervention, through using sensors</u>
The seat belt	<u>Reduces the rushing forward of the driver towards the steering wheel or the windshield during sudden stopping.</u>
The airbag	<u>Works with the seat belt to prolong (increase) the collision time and thus reducing the rate of change of the velocity (acceleration) which in turn minimizes the impact of the collision on the driver.</u>

8 Choose the correct answer

Unit 1

1- The correct definition of endothermic dissolution is

- (A) A process in which thermal energy is absorbed from the surrounding environment.
- (B) A process in which no exchange of thermal energy occurs.
- (C) A process in which chemical energy is converted into thermal energy.
- (D) A process in which thermal energy is released into the surrounding environment.

2- A common example of endothermic dissolution is

- (A) the dissolution of sodium carbonate
- (B) dissolving (NH_4NO_3) in water
- (C) the dissolution of sodium hydroxide
- (D) the dissolution of calcium chloride

3- A common example of exothermic dissolution is

- (A) Dissolving potassium sulphate.
- (B) Dissolving ammonium nitrate (NH_4NO_3) in water.
- (C) Dissolving sodium hydroxide.
- (D) Dissolving (NaHCO_3)

4- When instant cold compresses are used, it works by the blood vessels in the affected area, which leads to reduced blood flow and reduced swelling.

- (A) Widening
- (B) narrowing
- (C) Heating
- (D) Dissolving

5- Raise the temperature of the water when dissolved in it.

- (A) Ammonium nitrate.
- (B) Potassium chloride.
- (C) Sodium hydroxide.
- (D) Hydrated copper sulfate.

6- In exothermic reactions, the final temperature (T_2) is the initial temperature (T_1)

- (A) Lower than
- (B) higher than
- (C) equal to
- (D) half

7- When a magnesium strip reacts with dilute hydrochloric acid, heat is transferred from

- (A) The surrounding medium to the system
- (B) The system to the surrounding medium
- (C) The products to the reactants
- (D) The beaker to the thermometer only

8- Which of the following reactions is an example of an endothermic reaction ?

- (A) Magnesium reacting with hydrochloric acid
- (B) Calcium oxide reacting with water
- (C) Barium hydroxide reacting with ammonium chloride
- (D) Thermite reaction

9- The German scientist who proved that energy cannot be created or destroyed is :

- (A) Einstein (B) Newton (C) Hermann von Helmholtz (D) Dalton

10- The process of breaking the bonds between atoms in reacting substances is :

- (A) Exothermic (B) endothermic
(C) Not accompanied by heat change (D) produces electrical energy

11- In the energy diagram of an exothermic reaction, the energy level of the products is..... the energy level of the reactants.

- (A) Higher than (B) lower than (C) equal to (D) parallel to

12- The substance is used in self-heating packages.

- (A) Ammonium chloride (B) Calcium oxide (quicklime)
(C) Sodium bicarbonate (D) Ammonium nitrate

13- The substance responsible for the "refreshing sensation" (coolness) when eating fizzy sweets is

- (A) Citric acid only (B) Glucose
(C) A mixture of sodium bicarbonate and citric acid (D) Iron oxide

14- The thermite reaction is used in

- (A) Cooling drinks (B) welding railroad tracks
(C) Making lemon batteries (D) making candy

15- In the lemon battery experiment, energy is converted from energy to electrical energy.

- (A) Thermal (B) kinetic (C) chemical (D) light

16- When ammonium chloride powder is added to barium hydroxide and the mixture is stirred, we observe

- (A) The temperature of the beaker rises.
(B) The mixture ignites.
(C) The temperature of the beaker drops and a layer of frozen water forms.
(D) No change occurs.

17- The correct equation for the reaction of quicklime with water is

- (A) $\text{Ca O} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + \text{heat}$ (B) $\text{Ca CO}_3 \rightarrow \text{Ca O} + \text{CO}_2$
 (C) $2\text{Mg} + 2\text{HCl} \rightarrow \text{Mg Cl}_2 + \text{H}_2$ (D) $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$

18- In an endothermic reaction, the value of the change in heat content is

- (A) Negative (B) positive (C) zero (D) variable

19- The thermal change resulting from the melting of a certain amount of solute in a known volume of solvent to form a solution is called

- (A) Activation energy. (B) enthalpy of the material.
 (C) Heat of dissolution. (D) Specific heat.

20- Which of the following material transformations is considered "exothermic"?

- (A) Fusion. (B) Evaporation. (C) Sublimation. (D) Freezing.

21- When a crystalline (hydrated) salt such as $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ is dissolved in water, the color turns into

- (A) White. (B) Pink. (C) Blue. (D) The color does not change.

22- In the cooling cycle inside the refrigerator at any stage the heat is "absorbed" from the food

- (A) During the process of compressing the gas by the motor.
 (B) While the coolant is expanding and evaporating inside the refrigerator.
 (C) While the gas is condensing in the grid behind the refrigerator.
 (D) During the transfer of heat to the surrounding medium (air).

23- Using the following thermal equation :



Which of the following statements is true regarding this reaction?

- (A) Used in the manufacture of instant refrigeration packaging.
 (B) The final temperature of T_2 is lower than the primary T_1 .
 (C) The energy released when the bonds are formed is greater than the energy absorbed to break them.
 (D) The reaction represents the pyrolysis of the material.

24- The combustion process is based on 3 basic elements called "fire represented". Which of the following represents these elements from

- (A) Fuel, nitrogen gas, heat. (B) Fuel, oxygen gas, heat.
(C) Carbon dioxide, fuel, oxygen. (D) Water, heat, oxygen.

25- According to the chemical reaction $\text{CuO} + \text{H}_2 \xrightarrow{\Delta} \text{Cu} + \text{H}_2\text{O}$.

Which substance is considered the reducing agent

- (A) Copper oxide (CuO). (B) Copper (Cu).
(C) Hydrogen gas (H₂). (D) Water vapor (H₂O).

26- It is completely forbidden to use water to extinguish sodium or potassium fires in laboratories

- (A) Because water evaporates quickly.
(B) Because water freezes when it comes into contact with these metals.
(C) Because the reaction with water is highly exothermic and leads to the ignition of the rising hydrogen gas.
(D) Because the density of water is less than that of sodium.

27- When the amount of oxygen is abundant (too sufficient) in a gasoline stove, the flame appears in colour.

- (A) Yellow. (B) Red. (C) Blue (complete combustion). (D) Orange.

28- A small percentage of ethanethiol gas is added to the natural gas used in households

- (A) To raise the calorific value of natural gas when it is combusted.
(B) to act as a catalyst that increases the speed of natural gas combustion.
(C) To facilitate the detection of gas leaks due to its characteristic garlic-like smell.
(D) To reduce carbon dioxide emissions from combustion.

29- When a stream of hydrogen gas is passed over the heated black copper oxide powder

- (A) The tube explodes due to the rise of oxygen gas.
(B) No reaction occurs because hydrogen is an inert gas.
(C) Hydrogen oxide is formed and the powder turns into red copper.
(D) The colour of the powder changes from black to white.

30- Ethanol prepared from cornstarch is a fuel, while hydrogen is a fuel.

- (A) Artificially / Biologically (B) Fossil / Naturally
(C) Biologically / Artificially (D) Solid / Liquid

31- is the substance that gives oxygen during a chemical reaction."

- (A) Combustible material (B) Catalyst
(C) Biofuel (D) Oxidizing agent

32- Water is not used to extinguish oil fires because

- (A) The density of oil is lower than that of water, so it floats on its surface and remains burning.
(B) The water cools the petroleum quickly, causing it to freeze.
(C) Water chemically reacts with petroleum and produces toxic gases.
(D) Water hydrolyses by heat into oxygen that increases the ignition of a fire.

33- Which is the substance that changes colour from blue to pink when drops of water are added to it?

- (A) Anhydrous cobalt chloride. (B) Anhydrous copper sulphate.
(C) Hydrated cobalt chloride. (D) Hydrated copper sulphate.

34- What change occurs in all endothermic processes?

- (A) A change in the solution colour.
(B) Solid substances melt.
(C) A gas evolves.
(D) The temperature of the surrounding medium decreases.

35- The dissolution of the following substances in water is accompanied by the release of thermal energy, except

- (A) Sodium hydroxide. (B) Calcium chloride.
(C) Sodium carbonate. (D) Sodium bicarbonate.

36- The dissolution of which of the following substances in water leads to a chemical change accompanied by the release of thermal energy?

- (A) Sodium hydroxide. (B) Calcium oxide.
(C) Sodium carbonate. (D) Sodium chloride.

37- Each of the following represents an element of the fire triangle, except

- (A) heat. (B) water. (C) fuel. (D) Oxygen.

38- Which fuel of the following has the highest calorific value?

- (A) Natural gas. (B) Ethanol. (C) Hydrogen. (D) Wood.

39- Which of the following describes the reaction of potassium permanganate with glycerin?

- (A) Endothermic and spontaneous ignition reaction.
(B) Exothermic and spontaneous ignition reaction.
(C) It occurs by heating although it is exothermic.
(D) It occurs by cooling although it is endothermic.

40- A net force of 1 N means an object of mass 1 kg is

- (A) moving at an acceleration of 10 m/s^2
(B) moving at an acceleration of 1 m/s^2
(C) lifted vertically at a velocity of 1 m/s .
(D) lifted vertically at a velocity of 10 m/s

41- Which of the following did Newton discover?

Unit 2

- (A) Electricity (B) Gravity (C) Nuclear Forces (D) Laws of Electromagnetism

42- Which of Newton's laws explains the relationship between force, mass, an acceleration?

- (A) First Law (B) Second Law (C) Third Law (D) Law of Attraction

43- Why is Newton considered one of the greatest scientists?

- (A) Because he invented electricity
(B) because he contributed to physics and mathematics
(C) Because he discovered penicillin
(D) because he invented the airplane

44- An object moves at an acceleration (a), if the object mass is halved and the net force acting on it is doubled, its acceleration of motion will be

- (A) a (B) 2 a (C) 3 a (D) 4 a

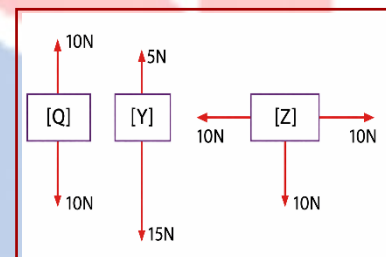
45- Which of the following bodies has the greatest inertia?

- (A) A ball of mass 0.1 kg moving at velocity 50 m/s
- (B) A runner of mass 70 kg moving at velocity 30 m/s
- (C) A car of mass 1000 kg moving at velocity 50 m/s
- (D) A van of mass 2000 kg moving at velocity 30 m/s

46- The opposite figures show three objects X, Y, Z each object is affected by several forces :

Which object is affected by a non-zero net force (unbalanced forces)?

- (A) Objects X, Y, Z
- (B) Object X only.
- (C) Objects Y and Z only.
- (D) Object Y only.



47- Launching a rocket in a direction opposite to that of the expelled gases is explained by

- (A) Newton's first law.
- (B) Newton's second law.
- (C) Newton's third law.
- (D) law of universal gravitation.

9 Define the following (what is meant by)

Unit 1

Refrigeration cycle in the refrigerator	<u>It is a closed and repeated thermal process, in which heat is withdrawn (extracted) from inside the refrigerator and transferred to the refrigerator the surrounding medium (air) using a refrigerant (eco-friendly freons).</u>
Heat of dissolution	<u>It is the amount of heat absorbed or released when dissolving a specific quantity of solute in a known volume of solvent to form a solution.</u>
Exothermic dissolution	<u>It is a physical change accompanied by the release of thermal energy to the surroundings when a substance dissolves in water.</u>
Endothermic dissolution	<u>It is a physical change accompanied by the absorption of thermal energy from the surroundings when a substance dissolves in water.</u>

Law of conservation of energy	<u>Energy is neither destroyed nor created, but can be transformed from one form to another.</u>
Exothermic reactions	<u>Reactions that release thermal energy to the surroundings as a product of the reaction, causing the temperature of the surroundings to rise.</u>
Endothermic reactions	<u>Reactions that require the absorption of thermal energy from the surroundings, causing the temperature of the surroundings to decrease (be lowered).</u>
Fuel	<u>It is a flammable material used to produce thermal energy (heat) as a result of the occurrence of an exothermic reaction.</u>
Calorific value of fuel	<u>It is the amount of energy produced from the combustion of 1 g of fuel in excess of oxygen gas.</u>
Combustion	<u>It is the process of the combination of fuel with oxygen which is usually accompanied by the emission of light, heat, or both.</u>
Ignition point	<u>It is the temperature at which the material begins to ignite.</u>
Spontaneous combustion	<u>It is the ignition of materials without the presence of an external source of heat.</u>
Oxidation process	<u>A chemical process in which the percentage of oxygen increases in the substance or the percentage of hydrogen decreases in it.</u>
Reduction process	<u>A chemical process in which the percentage of oxygen decreases in the substance or the percentage of hydrogen increases in it.</u>
Reducing agent	<u>It is the substance that gives (donates) hydrogen to, or takes oxygen away from another substance during the chemical reaction.</u>
Oxidizing agent	<u>It is the substance that gives (donates) oxygen to, or takes hydrogen away from another substance during the chemical reaction.</u>

Unit 2

Net force	<u>The total force in magnitude and direction resulting from the effect of a number of forces acting on an object.</u>
Newton's first law (Law of inertia)	<u>The object keeps its state of rest or motion at a constant velocity in a straight line, unless acted upon by external unbalanced forces that change its state.</u>
Stopping time	<u>The time taken for the moving object to stop.</u>
Stopping distance	<u>The distance travelled by the moving object during the stopping time.</u>
Acceleration (a)	<u>The change in the velocity of the object per unit time. Or The rate of change of the velocity.</u>
Newton's second law	<u>If a net force (F) acts on an object of mass (m), it causes the object to have an acceleration (a) in the same direction as the net force.</u>
Newton's third law Newton's laws	<u>For every action, there is an equal and opposite reaction.</u>

10 compare between each of the following

Unit 1

1- Exothermic process and Endothermic process

1	Exothermic process	Endothermic process
Definition	<u>It is a physical change accompanied by the release of thermal energy to the surroundings when a substance dissolves in water.</u>	<u>It is a physical change accompanied by the absorption of thermal energy from the surroundings when a substance dissolves in water.</u>
Examples	• <u>Sodium hydroxide</u> • <u>Calcium chloride</u> • <u>Sodium carbonate</u>	• <u>Ammonium nitrate</u> • <u>Potassium sulphate</u> • <u>Sodium bicarbonate</u>

	• <u>Magnesium sulphate</u> • <u>Anhydrous copper sulphate</u> • <u>Anhydrous cobalt chloride</u> • <u>Anhydrous lithium chloride</u>	• <u>Hydrated copper sulphate</u> • <u>Hydrated cobalt chloride</u> • <u>Hydrous lithium chloride</u>
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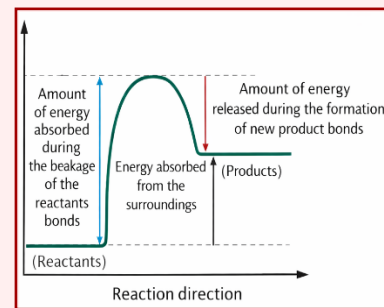
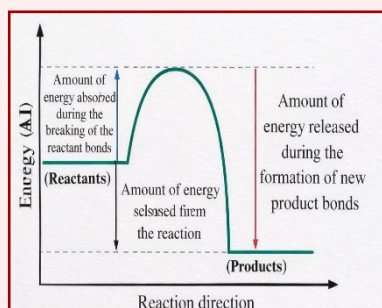
2- Instant hot compresses (Packs) and Instant cold compresses (Packs)

2	Instant hot compresses (Packs)	Instant cold compresses (Packs)
The solute (Dissolved salt)	<u>Magnesium sulphate salt</u> $\text{MgSO}_4(\text{s})$	<u>Ammonium nitrate salt</u> $\text{NH}_4\text{NO}_3(\text{s})$
Its use	<u>They are used to relieve pain associated with muscle fatigue (strain)</u>	<u>They are used to reduce the severity of swelling.</u>
The occurring thermal change	<u>Exothermic dissolution</u>	<u>Endothermic dissolution</u>

3- Exothermic reactions and Endothermic reactions

3	Exothermic reactions	Endothermic reactions
Thermal change for the system and surroundings	<u>The temperature of system and the surroundings increases</u>	<u>The temperature of the system and the surroundings decreases.</u>
Examples	• <u>Reactions of metals with dilute</u> • <u>Decomposition reaction of acids.</u> • <u>Reactions of alkalis with acids.</u> • <u>Reactions of metal carbonates with dilute acids.</u>	• <u>Decomposition reaction of calcium carbonate.</u> • <u>Decomposition reaction of ozone gas in the atmosphere.</u> • <u>Reaction of sodium bicarbonate with dilute acids.</u>

Energy diagram



4- Fossil fuel, Biofuel and Synthetic fuel

4	Fossil fuel	Biofuel	Synthetic fuel
Fossil fuel	<u>Petroleum oil.</u> <u>Examples Natural gas.</u> <u>Coal.</u>	<u>Ethyl alcohol (ethanol)</u>	<u>Hydrogen gas (fuel of the future)</u>
Usage	<u>The most widely used in the world till now, even though it is a non-renewable resource</u>	<u>It is used as a fuel for cars in some countries after being mixed with gasoline</u>	<u>It is used as a fuel for cars and trucks powered by fuel cells (hydrogen fuel cells)</u>

5- The fire triangle (Combustion triangle) and The extinguishing fire triangle

5 The fire triangle (Combustion triangle)	The extinguishing fire triangle
<u>It composes of three main elements, which are :</u> <u>Fuel.</u> <u>Oxygen.</u> <u>Heat.</u>	<u>It composes of three main principles, which are :</u> <u>Fuel removal.</u> <u>Smothering.</u> <u>Cooling.</u>

6- Oxidation process and Reduction process

6	Oxidation process	Reduction process
definition	<u>A chemical process that leads to an increase in the percentage of oxygen in the substance or a decrease in the percentage of hydrogen in it</u>	<u>A chemical process that leads to a decrease in the percentage of oxygen in the substance or an increase in the percentage of hydrogen in it</u>
Example	<u>Passing a stream of air on a powder of red-hot copper, forming black copper oxide compound</u> $2\text{Cu}_{(s)} + \text{O}_{2(g)} \xrightarrow{\Delta} 2\text{CuO}_{(g)}$	<u>Passing a stream of hydrogen gas on black copper oxide with heating, forming reddish-brown copper</u> $\text{H}_{2(g)} + \text{CuO}_{(g)} \xrightarrow{\Delta} \text{Cu}_{(g)} + \text{H}_2\text{O}_{(v)}$

7- Reducing agent and Oxidizing agent

7 Reducing agent	Oxidizing agent
<u>The substance that takes oxygen away or gives (donates) hydrogen during the chemical reaction.</u> <u>Undergoes an oxidation process.</u>	<u>The substance that takes hydrogen away or gives (donates) oxygen during the chemical reaction.</u> <u>Undergoes a reduction process.</u>

8- Elastic collision and Inelastic collision

8	Elastic collision	Inelastic collision
Loss of kinetic energy	<u>No loss of energy occurs</u>	<u>There is a loss of energy</u>
Velocity of objects after collision	<u>Stationary object : Its velocity becomes equal to the velocity of the moving object before the collision.</u>	<u>Both objects (stationary and moving) move after the collision at half the velocity of the moving object before the collision</u>

- Moving object: It stops and its velocity becomes zero.

11 Correct the following statements

Unit 1

1- In exothermic reactions, the final temperature T_2 is lower than the initial temperature T_1 .

In exothermic reactions, T_2 is higher than T_1

2- The CaCO_3 decomposition reaction is an example of exothermic reactions.

CaCO_3 decomposition is an example of endothermic reactions.

3- The less energy the bond, the harder it is to break.

The less energy the bond, the easier it is to break.

4- In an endothermic reaction, the system absorbs heat energy that causes the increase in the temperature of the surrounding medium

In endothermic reactions, the system absorbs heat causing decrease.

5- Self-heating packaging is based on the reaction of calcium oxide with water, which is an endothermic reaction.

It is an exothermic reaction

6- Natural gas is mainly made up of propane gas

Natural gas is mainly made up of methane (CH_4) gas.

7- Oxidation is a process that results in a lack of oxygen in a material.

Oxidation is a process that results in gaining oxygen.

8- A reducing agent is defined as the substance that gives oxygen during a reaction.

A reducing agent is the substance that takes oxygen during a reaction.

9- The calorific value of wood is higher than the calorific value of hydrogen.

The calorific value of hydrogen is much higher than that of wood.

Unit 2

10- The acceleration with which the object moves increases as its mass increases when the force is constant.

The acceleration decreases as mass increases when force is constant.

11- The forces of action and reaction affect on the same body and therefore do not cancel each other out.

Forces of action and reaction affect two different bodies.

12- Newton's second law is known as the law of inertia.

Newton's first law is known as the law of inertia..

13- If two forces of equal magnitude and opposite in direction act along same line of action, the resultant is the sum of the two forces.

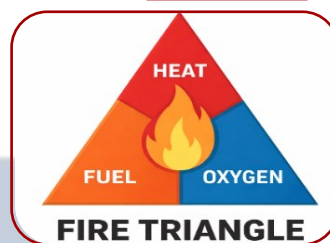
The resultant is zero

14- Mass is considered a vector physical quantity.

Mass is a scalar physical quantity.

12 Various questions

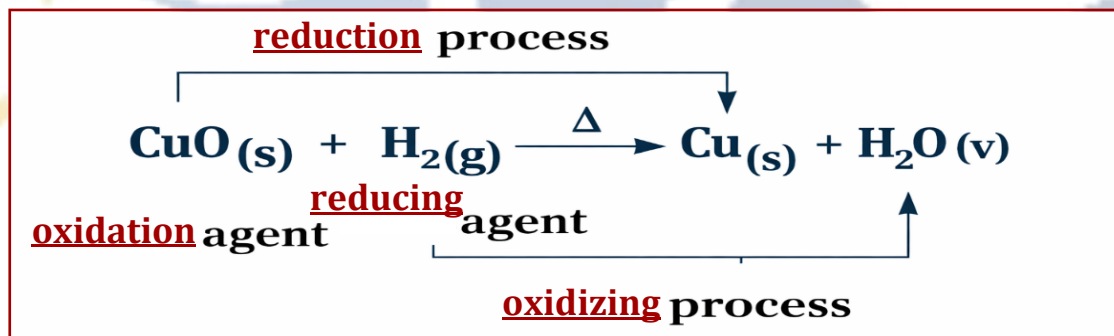
Unit 1



1. The combustion triangle consists of :

1- Fuel 2- Oxygen 3- Heat

2. Study the following equation carefully, then answer the question:



Complete the data on the previous equation :

- Oxidized to increase the oxygen content Is hydrogen
- CuO Called by oxidizing agent because it gives oxygen to hydrogen

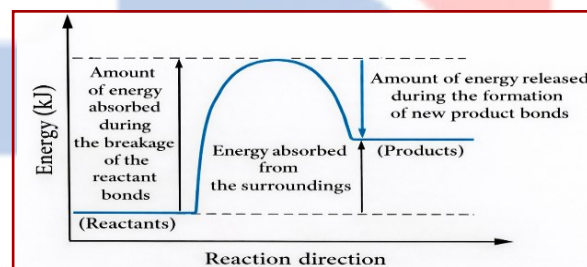
3. It reduced CuO to decrease the amount of oxygen
4. H_2 Called by reducing agent because it takes away oxygen form CuO

3. Technology of food preservation by air evacuation

Evacuating air from food packing creates a low oxygen environment which reduces Oxidation and reduction reactions which lead to spoiling of food



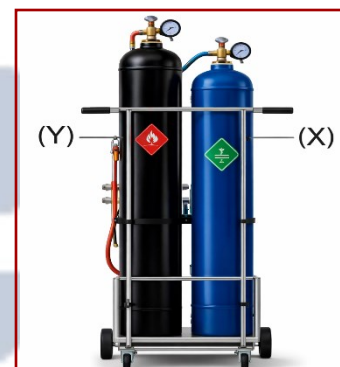
4. Draw the energy diagram for an endothermic reaction.



5. The figure shows a cylinder (X) containing a compressed gas that helps burning, and a cylinder (Y) containing a compressed flammable gas. Their mixture can produce a flame used in welding metals :

(1) Name the gases in cylinders (X) and (Y).

- (X): Oxygen gas.
- (Y): Acetylene gas.



(2) What is the name of the flame produced? What is its temperature?

Oxyacetylene flame / Its temperature reaches 3000°C

Unit 2

6. The figure in front of you is a ball rolling on a rough ground and then stopping after a distance.

1- What is the reason for the ball stopping?

The ball stops because of friction between the ball and the rough ground, which acts as an opposing force that slows the ball down.



2- What is the name of the force acting on the ball?

The force is called friction force.

3- Can an object be moving and stationary at the same time? Illustrate your answer with an example from everyday life

No. An object cannot be moving and stationary at the same time. Example: A ball rolling on the ground is moving — it cannot be stationary at the same moment.

4- What happens to the motion of the ball if the rough surface is replaced by a smooth surface?

The ball will continue moving for a much longer distance without stopping because there is no friction to slow it down.

7. Look at the picture in front of you Then answer the following :

1- Determine the direction of each force acting on the vehicle (use arrows)

Both people push the car in the same direction →

Both forces point forward (→)

2- Calculate the net force if each force is 50 newtons.

Net Force = 50 + 50 = 100 N

3- Does the car move or remain stationary? With the explanation? and if it moves, what is the direction of its movement?

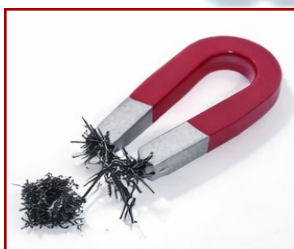
The car will move to the forward direction with 100N force

4- Choose the correct answer : the net force is

- (A) The greatest force acting on the body
- (B) **The sum of the forces acting on the body**
- (C) The sum of the masses acting on the body
- (D) The sum of the forces acting on a same line of action

8. Types of Forces :

Choose the appropriate type of force for each of the following images (Push-Pull)



(.....pull...)



(.....push.....)



(.....pull.....)



(.....push.....)

9. Balanced and unbalanced forces



(Balanced Forces)



(Unbalanced Forces)

1. What happens if two tug-of-war teams are equal in force?

The rope does not move and remains stationary because the forces are balanced and the net force = zero.

2- How do you know if a rope is moving due to an unbalanced force?

he rope moves towards the stronger team, which means one team is exerting a greater force

3-What is the relationship between the number of players or the force they exert on the movement of the rope?

The greater the number of players or the greater the force a team exerts, the more likely the rope will move towards their side

10. The figure (3) in front of you shows a stationary object : that is affected by a set of forces

a) Calculate the net forces

Net force right $5+5+4=14\text{N}$

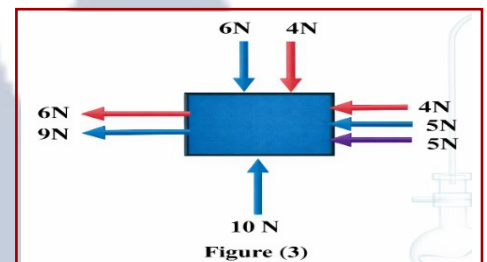
Net force left $6+9=15\text{N}$

Net force down $6+4=10\text{N}$

Force up 10N

Total net force right+left $=(14+15)=39\text{N}$

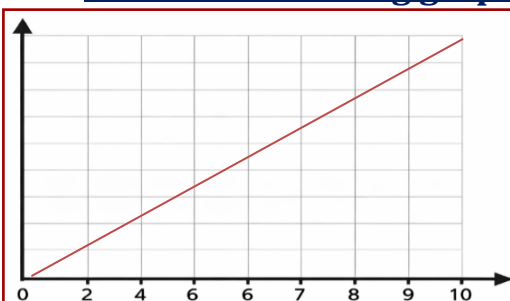
Total net force up- down $=(10+10)=0\text{N}$



b) Does the object remain stationary or will it move? mentioning the reason

The object will MOVE because the forces are unbalanced — the net force is not equal to zero.

11. Draw the following graph from the following table :



Force	Acceleration
2	1
4	2
6	3
8	4
10	5

-From the graph :

1- Calculate the object's mass?

$$m = F \div a = 2 \div 1 = 2 \text{ kg}$$

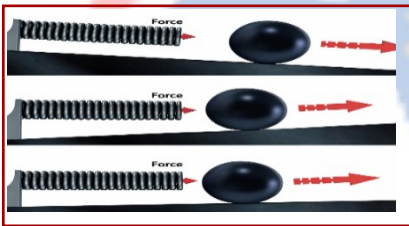
2- Determine the independent factor, the dependent factor and the control factor

Independent factor (what we change) Force (N)

Dependent factor (what changes as a result) Acceleration (m/s^2)

Control factor (what stays constant) Mass of the object (2 kg)

12. Notice the following set of images and then select which of Newton's laws applies to them?



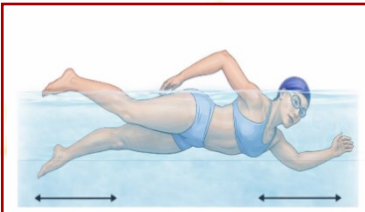
(Newton's Second Law)



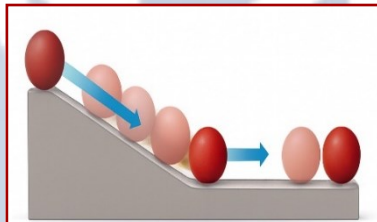
(Newton's Third Law)



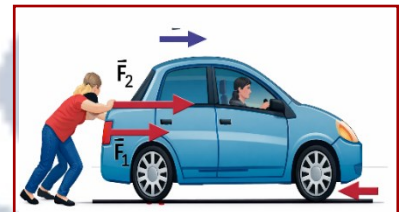
(Newton's Third Law)



(Newton's Third Law)



(Newton's First Law)



(Newton's Second Law)



(Newton's Second Law)



(Newton's Third Law)

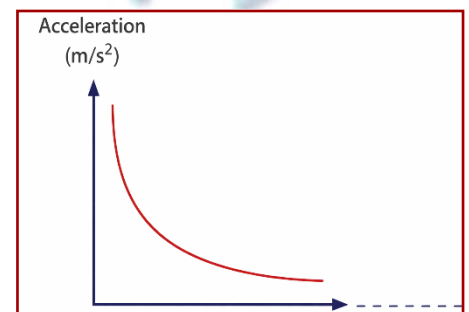


(Newton's Third Law)

13. Based on your understanding of Newton's second law :

What does the horizontal axis represent in the given graph?

Mass (kg).



حمل الآن

مجاناً وحصرياً

المراجعة رقم (4)

اختبار شهر مارس





March Revision

Mr. Ahmed Elbasha

★ **(1) Write the scientific term:**

- 1) Energy is neither destroyed nor created, but it is transformed from one form to another. (.....)
- 2) Reactions that release thermal energy to the surroundings as a product, causing the temperature of the surroundings to rise. (.....)
- 3) The reaction of heating aluminum with red iron oxide. (.....)
- 4) Reactions that require the absorption of thermal energy from the surroundings, causing the temperature of the surroundings to decrease. (.....)
- 5) Flammable materials used in the production of thermal energy as a result of the occurrence of an exothermic reaction. (.....)
- 6) The amount of energy produced from the combustion of 1 g of fuel in excess oxygen gas. (.....)
- 7) The combination of fuel with oxygen, accompanied usually by the emission of light, heat, or both. (.....)
- 8) The combustion of fuel in a limited amount of oxygen gas. (.....)
- 9) The temperature at which fuel begins to ignite. (.....)
- 10) Ignition of materials without the presence of an external source of heat. (.....)
- 11) A chemical process in which the percentage of oxygen increases in the substance or the percentage of hydrogen decreases in it. (.....)
- 12) A chemical process in which the percentage of oxygen decreases in the substance or the percentage of hydrogen increases in it. (.....)
- 13) The substance that takes away oxygen or gives hydrogen during the chemical reaction. (.....)

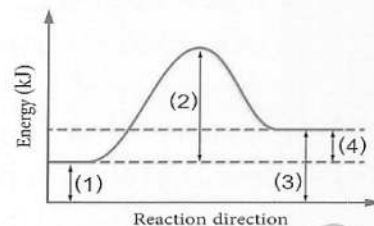
- 14) The substance that gives oxygen or takes away hydrogen during the chemical reaction. (.....)
-
- 15) The total force in magnitude and direction resulting from the effect of a number of forces acting on an object. (.....)
-
- 16) The scientist who formulated the laws of motion and the universal law of gravitation. (.....)
-
- 17) The object keeps its state of rest or motion at a constant velocity in a straight line, unless acted upon by external unbalanced forces that change its state. (.....)
-
- 18) The time taken for the moving object to stop. (.....)
-
- 19) The distance travelled by the moving object during the stopping time. (.....)
-
- 20) The change in the velocity of an object per unit time. (.....)
-
- 21) The rate of change of velocity. (.....)
-
- 22) If a net force (F) acts on an object with a mass (m), it causes the object to have an acceleration (a) in the same direction as the net force. (.....)
-
- 23) For every action, there is an equal and opposite reaction. (.....)
-
- 24) A collision between a stationary object and a moving object having the same mass and no loss of kinetic energy occurs. (.....)
-
- 25) A collision between a stationary object and a moving object having the same mass in which kinetic energy is lost. (.....)

***(2) Choose the right answer:**

1. All of the following are exothermic processes, except the process.
a. freezing b. sublimation c. condensation d. deposition
2. Which of these substances, when dissolved in water, is accompanied by releasing thermal energy to the surrounding medium?
a. Hydrated cobalt chloride. b. Sodium bicarbonate.
c. Ammonium nitrate. d. Sodium hydroxide.
3. All of the following salts lead to a decrease in the temperature of the solution when dissolved in water, except
a. hydrated copper sulphate. b. sodium bicarbonate.
c. potassium sulphate. d. anhydrous lithium chloride.
4. The person who suffers from swelling in his feet uses a compress containing the solute (X). What is the substance (X)?
a. Concentrated sulphuric acid. b. Calcium chloride.
c. Sodium hydroxide. d. Ammonium nitrate.
5. In instant hot compresses, the solute is
a. MgSO_4 b. NH_4NO_3 c. NaHCO_3 d. K_2SO_4
6. When a strip of aluminum is immersed in dilute hydrochloric acid whose temperature is 25°C , the temperature of the solution becomes
a. greater than 25°C b. less than 25°C
c. equal to 25°C d. less than or equal to 25°C
7. Which of the following illustrates the molecular formula of each of limestone (X) and quicklime (Y)?
a. (X) : CaO , (Y) : CaCO_3 b. (X): CaCO_3 , (Y) : CaO
c. (X): CaCO_3 , (Y) : CaO d. (X): CaCO_3 , (Y) : Ca(OH)_2
8. In the reaction : $\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl} + \text{heat}$
What is the source of the thermal change in this reaction?
a. Absorption of energy during forming bonds only.
b. Releasing energy during breaking bonds only.
c. Absorption of energy during breaking bonds and releasing energy during forming bonds.
d. Releasing energy during breaking bonds and absorption of energy during forming bonds.

9. According to the opposite energy diagram: What is the number which indicates the amount of energy absorbed from the surroundings in this reaction?

- a. (1).
- b. (2).
- c. (3).
- d. (4).



10. What does the element (X) represent in the opposite combustion triangle?

- a. Carbon dioxide.
- b. Flame.
- c. Fuel.
- d. Water.



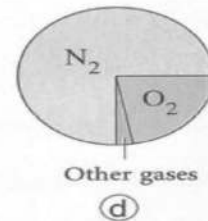
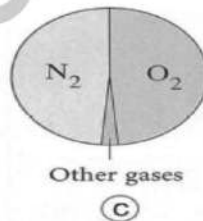
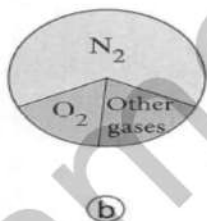
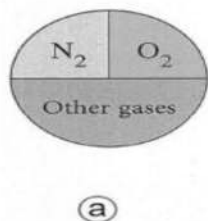
11. All the following are examples of fossil fuel, except

- a. petroleum oil
- b. ethanol.
- c. natural gas.
- d. coal.

12. The main component of natural gas is

- a. methane.
- b. ethane.
- c. propane.
- d. butane.

13. Which of the following figures expresses the percentage of oxygen relative to the other components of atmospheric air?



14. The candle remains lit for a longer time when a cylinder filled with gas is inverted over it.

- a. oxygen
- b. hydrogen
- c. carbon dioxide
- d. nitrogen

15. The combustion temperature of acetylene gas in excess oxygen reaches

- a. 150°C
- b. 300°C
- c. 1500°C
- d. 3000°C

16. All the following are principles of extinguishing, except

- a. removing fuel.
- b. smothering.
- c. isolating of carbon dioxide.
- d. cooling.

17. The equation: $\text{Mg} + \text{CuO} \xrightarrow{\Delta} \text{MgO} + \text{Cu}$ represents reaction.

- a. combustion
- b. thermal decomposition
- c. acid with alkali
- d. redox

18. From the reaction: $2\text{Mg} + \text{CO}_2 \rightarrow 2\text{MgO} + \text{C}$ Which of the following is correct?

- a. Both magnesium and carbon dioxide are oxidized.
- b. Carbon dioxide is oxidized and magnesium is reduced .
- c. Magnesium is oxidized and carbon dioxide is reduced.
- d. Both magnesium and carbon dioxide are reduced.

19. What is the oxidizing agent in this reaction : $\text{PbO}_2 + 2\text{H}_2 \xrightarrow{\Delta} \text{Pb} + 2\text{H}_2\text{O}$?

- a. PbO_2
- b. H_2
- c. Pb
- d. H_2O

20. All the following include vector physical quantities, except

- a. acceleration and force.
- b. force and time.
- c. acceleration and mass.
- d. mass and time.

21. The force is measured in units.

- a. newton.
- b. kilogram.
- c. meter.
- d. meter/second

22. When a moving car stops suddenly, the passengers are rushed

- a. forward.
- b. backward.
- c. to the right.
- d. to the left.

23. The continued rotation of the electric fan blades for a period of time after the electric current is switched off is explained by

- a. Newton's first law.
- b. Newton's second law.
- c. action and reaction force law.
- d. universal law of gravitation.

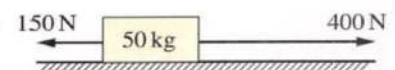
24. All the following are cases in which the object moves with acceleration, except

- a. when its velocity increases over time.
- b. when its velocity decreases over time.
- c. when it moves at a constant velocity.
- d. when its direction of motion changes.

25. Newton's second law is represented by the equation

- a. $F = \frac{m}{v}$
- b. $F = \frac{a}{m}$
- c. $F = ma$
- d. $a = \frac{F}{v}$

26. In the opposite figure:



1- The magnitude of the net force acting on the object equals

- a. 550N
- b. 400N
- c. 250N
- d. 150N

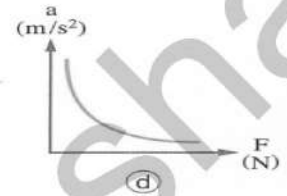
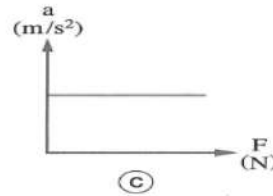
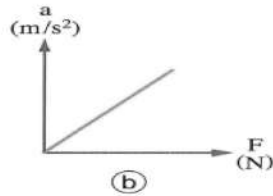
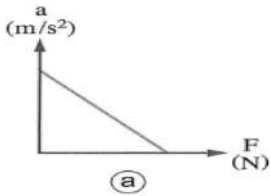
2- The acceleration of the object equals

- a. 1 m/s^2
- b. 2 m/s^2
- c. 4 m/s^2
- d. 5 m/s^2

27. The acceleration with which an object moves is directly proportional to

- a. the net force acting on it.
- b. its volume.
- c. stopping time.
- d. its mass.

28. Which of the following figures expresses the relationship between the acceleration of the object (a) and the force acting on it (F) when the mass of the object (m) is constant?



29. What does protect the driver from hitting the windshield of a moving car when the brakes are applied suddenly?

- a. Seat belt.
- b. Inertia.
- c. Speedometer.
- d. Cruise control.

30. An object moves at an acceleration (a), if the object mass is halved and the net force acting on it is doubled, its acceleration of motion will be

- a. a
- b. 2a
- c. 3a
- d. 4a

31. Launching a rocket in a direction opposite to that of the expelled gases is explained by

- a. Newton's first law.
- b. Newton's third law.
- c. Newton's second law.
- d. law of universal gravitation.

***(3) Put ($\checkmark$) or (X) :**

1. Hydrated substances turn into anhydrous substances by heating. ()
2. The chemical energy stored in lemon juice is converted into electrical energy, fulfilling the law of conservation of matter. ()
3. Breaking bonds between the atoms of the reactant molecules is accompanied by releasing heat energy to the surroundings. ()
4. In exothermic reactions, the final temperature is equal to the initial temperature. ()
5. Self-heating cans contain calcium hydroxide and water. ()
6. The reaction of iron with aluminum oxide is known as the thermite reaction. ()
7. In endothermic reactions, heat transfers from the system to the surroundings. ()
8. Endothermic reactions are accompanied by an increase in the temperature of the surroundings. ()
9. The common name of calcium carbonate is quicklime, while the common name of calcium hydroxide solution is limewater. ()
10. Propane gas represents 93% of the components of natural gas. ()
11. The mixture of propane and butane gases is odourless. ()
12. Nitrogen gas represents 21 % of the components of atmospheric air. ()
13. The combustion reaction is an endothermic reaction. ()
14. Fuel does not begin to ignite except after reaching a certain temperature known as the ignition point. ()
15. As the ignition point of the fuel decreases, its flammability increases. ()
16. Gas valves are closed during fires to isolate oxygen. ()
17. Water is characterized by its low specific heat. ()
18. The density of petroleum oil is greater than the density of water. ()
19. Oxidation and reduction processes are two separate processes that do not occur together at the same time in the chemical reaction. ()
20. Force is a scalar physical quantity, measured in newtons. ()
21. If two equal forces act on an object in opposite directions along the same line of action, the net force acting on the object is zero. ()

22. The greater the mass of the moving object, the greater its inertia, and the harder for it to be stopped. ()
23. When the velocity of an object changes over time, the object acquires acceleration in the same direction as the net force acting on it. ()
24. The greater the net force acting on the object, less its acceleration at constant mass. ()
25. The airbag works with the seat belt to increase the rate of change in velocity when the brakes are applied. ()
26. The action force and reaction force act without any time difference. ()
27. In elastic collisions, part of energy is lost as heat, sound or the object is deformed. ()
28. In drones, the downward push of air from the engines represents the reaction force. ()

✱(4) Complete the following:

1. Mass is a physical quantity, while force is a physical quantity.
2. Force is fully defined by and
3. The forces acting on an object are described as when their resultant of forces is zero, and as when their resultant of forces is not zero.
4. The passengers of the bus are rushed when it stops suddenly according to Newton's law.
5. When the velocity of an object increases or decreases, the object acquires whose direction is as the direction of the net force acting on the object.
6. The factors affecting acceleration are and
7. As the mass of the object increases, its acceleration at constant
8. The safety precautions in cars include,
9. Among the properties of the action force and reaction force is that they are in magnitude and in direction.
10. The air hockey game represents a technological application of Newton's law, while the flyboard represents a life application of Newton's law.

✱(5) Correct the underline:

1	<u>Hydrogen</u> is a main element in the combustion process.	(.....)
2	The mixture of propane and <u>methane</u> is known as butagas.	(.....)
3	The calorific value of <u>natural</u> gas fuel is the highest.	(.....)
4	The <u>bunsen flame</u> is used in cutting and welding metals.	(.....)
5	The colour of the bunsen flame varies according to the amount of <u>nitrogen</u> mixed with the fuel.	(.....)
6	<u>Manganese dioxide</u> gas is released when all types of fossil fuel are burned.	(.....)
7	<u>Water</u> is used in extinguishing magnesium fires.	(.....)
8	<u>Hydrogen</u> gas is used in fire extinguishers to isolate fires from air.	(.....)
9	In the reaction: $\text{H}_2 + \text{CuO} \xrightarrow{\Delta} \text{Cu} + \text{H}_2\text{O}$, <u>hydrogen</u> acts as the oxidizing agent.	(.....)
10	The scientist <u>Aristotle</u> studied the velocity of sound in air.	(.....)
11	The tendency of an object to maintain its state of motion is called <u>uniform speed</u> .	(.....)
12	When a stationary bus moves forward suddenly, its passengers are rushed <u>to the right</u> .	(.....)
13	If the net force acting on a stationary object equals zero, the object <u>moves with acceleration</u> .	(.....)
14	The backward movement of the cannon when the shell is propelled forward represents application of <u>Newton's first law</u> .	(.....)
15	The action force and reaction force always act on <u>one object</u> .	(.....)

***(6) Give reasons for:**

1. The dissolution process is accompanied by a thermal change.

.....

.....

2. The dissolution of anhydrous lithium chloride salt in water is exothermic.

.....

.....

3. Instant cold compresses are used to reduce the severity of swelling.

.....

.....

4. Instant hot compresses are used to relieve pain associated with muscle strain (fatigue).

.....

.....

5. The reactions of acids with alkalis are exothermic.

.....

.....

6. When barium hydroxide powder is added to ammonium chloride powder, the temperature of the surroundings decreases.

.....

.....

7. Ethyl alcohol is considered a renewable energy resource.

.....

.....

8. The use of biofuel is preferred over fossil fuel.

.....

.....

9. The oxyacetylene flame is used in cutting and welding metals.

.....

.....

10. Carbon dioxide gas is used in extinguishing fires.

.....

.....

11. Water is not used in extinguishing of petroleum oil fires.

.....

.....

12. Mass is a scalar physical quantity, while acceleration is a vector physical quantity.

.....

.....

13. Rushing the bus passenger forward when the bus stops suddenly.

.....

.....

14. Rushing the passenger of the stationary bus backward when it moves suddenly.

.....

.....

***(7) What happens when:**

1. Rubbing your hands using laundry powder (washing powder) and water
«In terms of: thermal change».
.....
.....
2. Increasing the mass of sodium hydroxide dissolved in water
«In terms of: thermal change».
.....
.....
3. Doubling the mass of solute while keeping the volume of solvent constant
«In terms of: Temperature».
.....
.....
4. Pressing on instant cold compresses.
.....
.....
5. Pressing the button found in the bottom of the self-heating can.
.....
.....
6. Complete combustion of acetylene gas in the presence of excess oxygen gas.
.....
.....
7. Drops of glycerin are added to potassium permanganate powder.
.....
.....
8. If two forces equal in magnitude and opposite in direction act on the same line of action on a stationary object.
.....
.....
9. If the net force acting on a stationary object does not equal zero.
.....
.....
10. If the net force acting on a moving object at constant velocity is zero.
.....
.....
11. Reducing the net force acting on the same object to half (Regarding the acceleration).
.....
.....

***(8) Mention the importance of the following:**

1. Instant cold compresses

.....

2. Instant hot compresses

.....

3. The thermite reaction

.....

4. Fuel of the future

.....

5. Natural gas and butagas

.....

6. Bunsen burner

.....

7. Oxyacetylene flame

.....

8. Fire extinguishers

.....

9. The seat belt

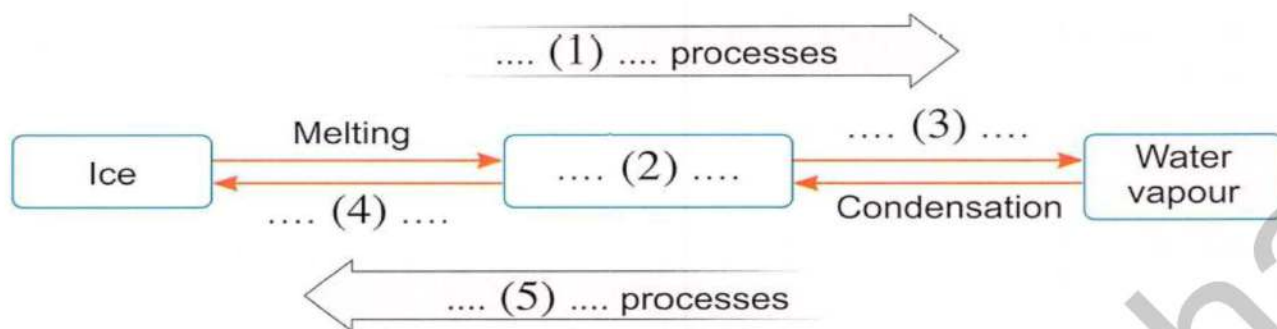
.....

10. The airbag

.....

*(9) Problems:

1. Complete the following diagrams:

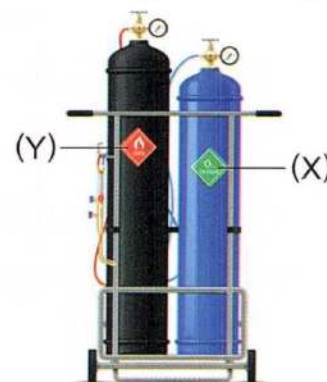


2. When dissolving blue anhydrous cobalt chloride in water at a temperature of 17°C , the temperature of the solution became 21°C :

- (1) Determine the type of this dissolution, with explanation.
- (2) Write the name and formula of the salt produced from the dissolution.
- (3) What happens when the salt produced from the dissolution is heated?

3. The figure shows a cylinder (X) containing a compressed gas that helps burning, and a cylinder (Y) containing a compressed flammable gas. Their mixture can produce a flame used in welding metals :

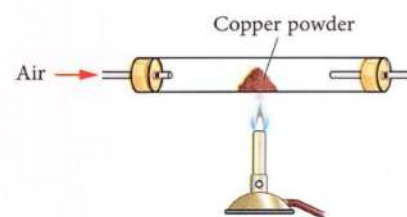
- (1) Name the gases in cylinders (X) and (Y).
- (2) What is the name of the flame produced? What is its temperature?



4. In the opposite figure, a stream of air is passed over red-hot copper powder:

What is the change that occurs to the colour of copper?

Explain.

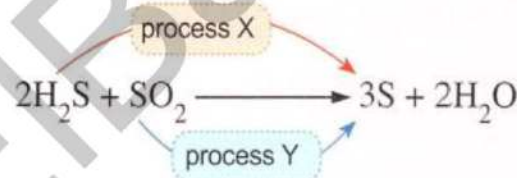


5. The opposite equation represents a redox reaction:

(1) Complete:

1- The process (X) represents process.

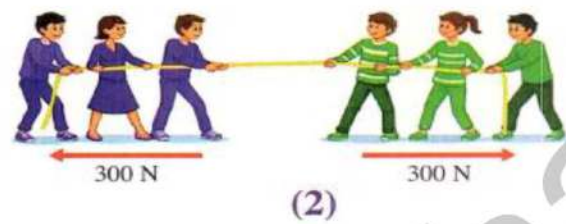
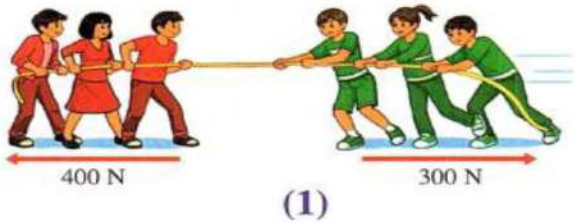
2- The process (Y) represents process.



5. Calculate the acceleration with which an object of mass 50 kg moves when acted upon by a net force of 200 N

6. Calculate the required force to move a car of mass 500 kg with an acceleration of 2 N/kg

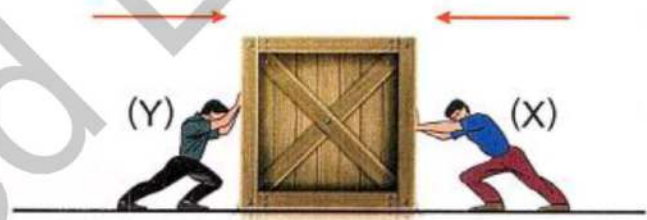
7. From the following two figures:



Which of the two cases represents:

- (1) Balanced forces ?
(2) Unbalanced forces?

8. Calculate the net force in each case if
the force of person (X) is 200 N and
the force of person (Y) is 300 N



Model Answer

*(1) Write the scientific term:

1. The Law of Conservation of Energy	6. Calorific value	13. Reducing agent	21. Acceleration
2. Exothermic reactions	7. Combustion	14. Oxidizing agent	22. Newton's Second Law of Motion
3. Thermite reaction	8. Incomplete combustion	15. Net force	23. Newton's Third Law of Motion
4. Endothermic reactions	9. Ignition point	16. Newton	24. Elastic collision
5. Fuel	10. Spontaneous combustion	17. Newton's First Law of Motion	25. Inelastic collision
	11. Oxidation	18. Stopping time	
	12. Reduction	19. Stopping distance	
		20. Acceleration	

*(2) Choose the right answer:

1. B	7. B	13. D	19. A	25. C	31. B
2. D	8. C	14. A	20. D	26. (1.c – 2.d)	
3. D	9. B	15. D	21. A	27. A	
4. D	10. C	16. C	22. A	28. B	
5. A	11. B	17. D	23. A	29. A	
6. A	12. A	18. C	24. C	30. D	

*(3) Put (✓) or (X) :

1. (✓)	6. (X)	11. (✓)	16. (X)	21. (✓)	26. (✓)
2. (X)	7. (X)	12. (X)	17. (X)	22. (✓)	27. (X)
3. (X)	8. (X)	13. (X)	18. (X)	23. (✓)	28. (X)
4. (X)	9. (X)	14. (✓)	19. (X)	24. (X)	
5. (X)	10. (X)	15. (✓)	20. (X)	25. (X)	

*(4) Complete the following:

1. scalar / vector	5. acceleration / same	9. equal / opposite
2. magnitude / direction	6. net force / mass	10. first / third
3. balanced / unbalanced	7. decreases	
4. forward / Newton's first	8. seat belts / airbags	

*(5) Correct the underline:

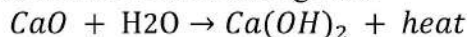
1. Oxygen	6. Carbon dioxide	11. Inertia
2. Butane	7. Sand	12. Backward
3. Hydrogen	8. Carbon dioxide	13. remains stationary
4. oxy-acetylene flame	9. copper oxide (CuO)	14. Newton's third law
5. oxygen	10. Newton	15. two different objects

*(6) Give reasons for:

- Because it is accompanied by a loss or absorption of thermal energy to or from the surroundings.
- Because it is accompanied by an increase in the temperature of the solution.
- Because they work by narrowing the blood vessels, which reduces blood flow to the injured area and thus reducing the swelling.
- Because they work by widening the blood vessels, which increases blood flow to the stressed areas, causing relaxing the contracting muscles and relieving pain.
- Because the amount of energy released during the formation of new bonds in the product molecules is greater than the amount of energy absorbed during the breakage of the bonds in the reactant molecules.
- Because it is an endothermic reaction accompanied by the absorption of thermal energy from the surroundings leading to decreasing the temperature.
- Because it is prepared from plants rich in starch such as corn plant.
- Because biofuel is a renewable resource, while fossil fuel is a non-renewable resource.
- Because the oxyacetylene flame reaches a temperature of 3000°C which is sufficient for that.
- Because it is a gas that does not burn and does not support burning.
- Because petroleum oil floats on the surface of water due to its lower density compared to that of water, which leads to the spread of fires instead of extinguishing them.
- Because to define mass, only its magnitude needs to be specified, while to define acceleration, both its magnitude and direction must be specified.
- Because the inertia of the passenger causes him to resist the sudden change
- Because the inertia of the passenger causes him to resist the sudden movement of the bus.

***(7) What happens when:**

1. Your hands feel warm.
2. The amount of change in temperature increases.
3. The temperature usually changes by a constant amount.
4. The thin bag ruptures, causing the solute to mix with water and an endothermic dissolution occurs.
5. The thin membrane which is between calcium oxide and water ruptures, so calcium oxide reacts with water forming calcium hydroxide solution with releasing heat.



6. The oxyacetylene flame is formed, which reaches a temperature of 3000°C
7. A spontaneous exothermic reaction occurs, leading to the emission of smoke with the formation of a purple-colored flame.
8. The object remains stationary.
9. The object moves in the same direction as the net force affected.
10. The object continues moving at the same constant velocity.
11. The acceleration is reduced to half.

***(8) Mention the importance of the following:**

1. to reduce the severity of swelling.
2. to relieve pain associated with muscles fatigue.
3. This reaction is used in welding the railway tracks.
4. It is used as fuel for cars and trucks powered by fuel cells (hydrogen fuel cells).
5. They are the main fuels used in households.
6. It is used as a source of heat in laboratories.
7. It is used for cutting and welding metals, such as steel (iron) and copper.
8. They are used to isolate fires from air (oxygen).
9. Reduces the rushing forward of the driver towards the steering wheel
10. It reduces the impact of the collision on the driver.

***(9) Problems:**

1	1. Heating 2. Water 3. Evaporation 4. Freezing 5. Cooling	2	(1) Exothermic dissolution/ Because the final temperature is higher than the initial temperature. (2) Hydrated cobalt chloride salt/ $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$ (3) Hydrated cobalt chloride (Pink) turns into anhydrous cobalt chloride (blue).
3	(X): Oxygen gas. (Y): Acetylene gas. (2) Oxyacetylene flame / Its temperature reaches 3000°C	4	It turns from reddish-brown to black/ Because copper combines with oxygen of atmospheric air, forming black copper oxide compound.
5	$a = \frac{f}{m} = \frac{200}{50} = 4 \text{ m/s}^2$	6	$f = m \times a = 500 \times 2 = 1000 \text{ N}$
7	Balanced forces – figure (2) Unbalanced forces – figure (1)	8	(to the right) $F = 300 - 200 = 100 \text{ N}$

حمل الآن

مجاناً وحصرياً

المراجعة رقم (5)

اختبار شهر مارس



February Revision

Q1 Choose the Correct Answer:

- Any of the following processes is accompanied by a decrease in the temperature of the solution:
 - Solubility of sodium hydroxide in water
 - Dissolution of ammonium nitrate in water
 - Condensation of water vapor
 - Dissolving the washing powder in water
- Which of the following bodies has the greatest inertia?
 - A ball of mass 0.1 kg moving at velocity 50 m/s
 - A runner of mass 70 kg moving at velocity 30 m/s
 - A car of mass 1900 kg moving at velocity 100 m/s
 - A van of mass 2000 kg moving at velocity 30 m/s
- Ammonium nitrate is used in the manufacture of cold compresses because its solubility in water:
 - Raises the temperature of the water
 - Reduces blood flow to the affected area
 - Absorbs heat energy from the surrounding medium
 - Causes instant boiling of water
- The German scientist who proved that energy cannot be created or destroyed is:
 - Einstein
 - Newton
 - Hermann von Helmholtz
 - Dalton
- When a crystalline (hydrated) salt such as $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ is dissolved in water, the color turns into:
 - White
 - Pink
 - Blue
 - The color does not change
- The substance that gives oxygen during a chemical reaction is:
 - Combustible material
 - Catalyst
 - Reducing agent
 - Oxidizing agent

7. The substance responsible for the "refreshing sensation" (coolness) when eating fizzy sweets is:
- Citric acid only
 - Glucose
 - A mixture of sodium bicarbonate and citric acid
 - Iron oxide
8. In the cooling cycle inside the refrigerator, heat is absorbed:
- During compression of the gas by the motor
 - While the coolant is expanding and evaporating inside the refrigerator
 - While the gas is condensing in the grid behind the refrigerator
 - During transfer of heat to the surrounding medium (air)
9. When an exothermic reaction occurs, heat energy is transferred from:
- Surrounding medium $\rightarrow$ system
 - System $\rightarrow$ surrounding medium
 - Thermometer $\rightarrow$ cup
 - Atmospheric air $\rightarrow$ reactants
10. Using the thermal equation:
 $\text{CaO (s)} + \text{H}_2\text{O (l)} \rightarrow \text{Ca(OH)}_2 \text{ (aq)} + \text{heat}$
Which statement is true?
- Used in instant refrigeration packaging
 - Final temperature T_2 is lower than T_1
 - Energy released when bonds form $>$ energy absorbed to break them
 - Represents pyrolysis of the material
11. The combustion process is based on 3 basic elements "fire triangle"
- Fuel, nitrogen gas, heat
 - Fuel, oxygen gas, heat
 - Carbon dioxide, fuel, oxygen
 - Water, heat, oxygen
12. According to the reaction:
 $\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$
Which is the reducing agent?
- Copper oxide (CuO)
 - Copper (Cu)
 - Hydrogen gas (H_2)
 - Water vapor (H_2O)

13. The thermal change resulting from the melting of a certain amount of solute in a known volume of solvent to form a solution is called:
- a) Activation energy
 - b) Enthalpy of the material
 - c) Heat of dissolution
 - d) Specific heat
14. Which of the following material transformations is considered exothermic?
- a) Fusion
 - b) Evaporation
 - c) Sublimation
 - d) Freezing
15. In an endothermic reaction, the value of the change in heat content is:
- a) Negative
 - b) Positive
 - c) Zero
 - d) Variable
16. Launching a rocket in a direction opposite to that of the expelled gases is explained by
- a) Newton's first law.
 - b) Newton's second law.
 - c) Newton's third law.
 - d) law of universal gravitation.
17. It is forbidden to use water to extinguish sodium or potassium fires because:
- a) Water evaporates quickly
 - b) Water freezes on contact with metals
 - c) Reaction with water is highly exothermic, igniting hydrogen gas
 - d) Density of water is less than sodium
18. If substance X ignites at 45°C and Y at 300°C , which is correct?
- a) Y ignites faster than X
 - b) X is safer to store than Y
 - c) X ignites faster than Y
 - d) Both ignite at the same time
19. A net force of 1 N means an object of mass 1 kg is
- a) moving at an acceleration of 10 m/s^2
 - b) moving at an acceleration of 1 m/s^2
 - c) lifted vertically at a velocity of 1 m/s
 - d) lifted vertically at a velocity of 10 m/s
20. Which of the following did Newton discover?
- a) Electricity
 - b) Gravity
 - c) Nuclear forces
 - d) Electromagnetism

- 21.** The substance used in self-heating packages is:
- a) Ammonium chloride
 - b) Calcium oxide (quicklime)
 - c) Sodium bicarbonate
 - d) Ammonium nitrate
- 22.** When oxygen is abundant in a gasoline stove, the flame color appears:
- a) Yellow
 - b) Red
 - c) Blue
 - d) Orange
- 23.** Ethanol from cornstarch is a ... fuel, while hydrogen is a ... fuel:
- a) Artificially / Biologically
 - b) Fossil / Naturally
 - c) Biologically / Artificially
 - d) Solid / Liquid
- 24.** The correct equation for the reaction of quicklime with water is:
- a) $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + \text{heat}$
 - b) $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
 - c) $2\text{Mg} + 2\text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$
 - d) $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
- 25.** A small percentage of ethanethiol gas is added to natural gas:
- a) To raise calorific value
 - b) To act as a combustion catalyst
 - c) To detect leaks
 - d) To reduce CO_2 emissions
- 26.** The process of breaking the bonds between atoms in reacting substances is:
- a) Exothermic
 - b) Endothermic
 - c) Not accompanied by heat change
 - d) Produces electrical energy
- 27.** When hydrogen gas is passed over heated black copper oxide powder:
- a) Tube explodes due to oxygen gas
 - b) No reaction occurs (hydrogen inert)
 - c) Hydrogen oxide forms, powder turns to red copper
 - d) Powder changes from black to white
- 28.** Water is not used to extinguish oil fires because:
- a) Water hydrolyses into oxygen, increasing ignition
 - b) Water cools petroleum too quickly, freezing it
 - c) Water reacts chemically with petroleum, producing toxic gases
 - d) Oil floats on water and keeps burning
- 29.** An object moves at an acceleration (a). If the object mass is halved and the force acting on it is doubled, its acceleration of motion will be..
- a) a
 - b) 2a
 - c) 3a
 - d) 4a

30. In the lithium chloride solubility experiment, if $T_1 = 21^\circ\text{C}$ and $T_2 = 25.5^\circ\text{C}$ when dissolving 1 g, what is the temperature change when dissolving 2 g in the same amount of water?

- a) 4.5°C b) 9°C c) 5.31°C d) 52.2°C

31. Which of the following reactions is an endothermic reaction?

- a) Magnesium reacting with hydrochloric acid
b) Calcium oxide reacting with water
c) Barium hydroxide reacting with ammonium chloride
d) Thermite reaction

Q2 Correct the wrong statements

1. In exothermic reactions, the final temperature T_2 is lower than the initial temperature T_1
2. The CaCO_3 decomposition reaction is an example of exothermic reactions
3. The less energy the bond, the harder it is to break
4. In an endothermic reaction, the system absorbs heat energy that causes the increase in the temperature of the surrounding medium
5. Self-heating packaging is based on the reaction of calcium oxide with water, which is an endothermic reaction
6. Natural gas is mainly made up of propane gas
7. Oxidation is a process that results in a lack of oxygen in a material
8. A reducing agent is defined as the substance that gives oxygen during a reaction
9. The calorific value of wood is higher than the calorific value of hydrogen
10. The acceleration with which the object moves increases as its mass increases when the force is constant
11. The forces of action and reaction affect on the same body and therefore do not cancel each other out
12. Newton's second law is known as the law of inertia

13. If two forces of equal magnitude and opposite in direction act along same line of action, the resultant is the sum of the two forces
14. Mass is considered a vector physical quantity

Q3 Complete the following sentences:

- 1.If two objects of equal mass collide with perfect elastic collision, their velocities after collision
- 2.Unit of force measurement iswhile The acceleration measurement unit isand The speed measurement unit is
- 3.In a lemon battery, energy stored in lemon juice is converted to energy.
- 4.If the resulting force is not equal to zero, so the force is
- 5.It is recommended to wear a when driving a car.
- 6..... allows the user to fly in the air upwards as the water rushes down through its openings.
- 7..... works by pushing air from the motors downwards, which is followed by pushing the air upwards with equal force.
- 8.In the collision, there is no loss of energy and the velocity is transferred completely.
- 9.In a chemical reaction, bond breaking is a process, while forming bonds is a process.
- 10.In inelastic collision, a loss of energy occurs in the form of or
- 11.In the energy diagram of the endothermic reaction, the energy of the products is the energy of the reactants.
- 12.Ethanol is a fuel, while hydrogen is a fuel.
- 13.The "thermit" reaction is used in and it is a reaction.
- 14.The "conservation law of energy" states that energy does not, but it can be converted from one form to another.

In the reaction: $\text{H}_2 + \text{CuO} \rightarrow \text{Cu} + \text{H}_2\text{O}$

- 15.Hydrogen gas undergoes process, so it is the agent.
- 16.Copper oxide undergoes process, so it is the agent.
- 17.When balanced forces act on an object, the bodyWhile when unbalanced forces affect the same body it
- 18.The reactions that are accompanied by the release of heat energy from the system to the surrounding medium are called reactions.

19. Atmospheric air is composed of nitrogen gas by % and oxygen gas by %.
20. The property of the body's resistance to changing its dynamic state is known as
21. The mathematical formula for Newton's second law is: $F = \dots\dots\dots$
22. The process that leads to an increase in the oxygen content of a substance is called the process.
23. The substance that removes oxygen or gives hydrogen is called the factor.
24. The temperature of the "oxyacetylene" flame reaches °C, used in cutting
25. The amount of force is measured in a unit called while the acceleration is measured in units of
26. The law that explains that an object remains as it is in terms of rest or motion unless it is affected by a force is called the law of
27. Every action has an equal reaction in and opposite in

Q4 Explain the meaning of each of the following:

- | | |
|--|--|
| 1. Exothermic reactions | 13. Ignition point |
| 2. Refrigeration cycle in refrigerator | 14. Spontaneous combustion |
| 3. Fuel | 15. Oxidation process |
| 4. Newton's second law | 16. Newton's third law |
| 5. Heat of dissolution | 17. Reduction process |
| 6. Exothermic dissolution | 18. Combustion |
| 7. Acceleration (a) | 19. Reducing agent |
| 8. Endothermic dissolution | 20. Newton's first law (Law of inertia). |
| 9. Law of conservation of energy | 21. Oxidizing agent |
| 10. Stopping distance | 22. Net force |
| 11. Endothermic reactions | 23. Stopping time |
| 12. Calorific value of fuel | |

Q5 Variant Questions

1. Ammonia burns completely in excess of oxygen gas



- (1) Identify the substances that undergo oxidation and those that undergo reduction.
- (2) What is the reducing agent in this reaction?

- (3) Write a balanced equation for the incomplete combustion of ammonia.
2. How can understanding of oxidation and reduction help in preservation of food?
3. A person pulled a 10 kg block box with a force of 50 N on a horizontal frictionless surface. How much acceleration does the box move?
4. An object with a mass of 15 kg is placed on the ground. How much force is needed to lift it vertically? (Note that the acceleration of gravity = 10 m/s^2)
5. Mention the names of the processes of matter transformation, then specify whether they are exothermic or endothermic.
6. What is the role of citric acid in lemons when making a battery?
7. Hydrogen gas reacts with chlorine gas

$$\text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \longrightarrow 2\text{HCl}(\text{g}) + \text{heat}$$
 - (1) Is this reaction exothermic or endothermic? Explain your answer.
 - (2) Which is greater: The energy absorbed during breaking bonds or the energy released during forming new bonds?
8. List three examples of substances that dissolve in water and represent exothermic dissolution.
9. Write the thermochemical equation expressing the thermite reaction, then mention the importance of this reaction.
10. If the initial temperature $T_1 = 20^\circ\text{C}$ and the final temperature $T_2 = 15^\circ\text{C}$, calculate :
 - The change in temperature ΔT and determine the type of dissolution.
11. A rocket that goes forward when the gas exits backwards. This is explained by Newton's third law
12. An object with a mass of 5 kg is affected by a force of 20 newtons
 Calculate the acceleration
13. What happens to the acceleration if the mass doubles as the force is constant ?
14. A car gains more speed when the engine power increases. What law makes this clear?

15. If a light ball is replaced by another heavy one, which the ball will be affect of more ? why?
16. A person pushes the wall, why doesn't the wall move despite the pushing?
17. A car moving at a constant speed on a straight road Which law explains this?
18. Calculate the acceleration at which a car of mass 1000 kg moves when the engine force is 1300 N (Ignoring friction force affecting the car).

Q6 Mention the Importance (or Use) of Each of the Following

- | | | |
|---|-----|-------------------------------------|
| 1. Exothermic reactions for some types of insects | 293 | 9. Spark plugs (Bougies) |
| 2. Self-heating cans | 295 | 10. Oxyacetylene flame |
| 3. The thermite reaction | 296 | 11. Fire extinguisher |
| 4. Ethyl alcohol (ethanol) | 297 | 12. Sand in laboratories |
| 5. Fuel of the future (hydrogen) | 298 | 13. Closing gas valves during fires |
| 6. Natural gas and butagas | 299 | 14. Newton meter (Spring balance) |
| 7. Ethanethiol gas | 300 | 15. Cruise control |
| 8. The flame of Bunsen burner | | 16. The seat belt |

Q7 Write what the following statement refers to

1. A flame produced from the ignition of a mixture of a gaseous fuel and oxygen.
2. A scientist who explained that objects tend to maintain their state of rest or motion unless acted upon by an external force.
3. The refrigerator coolant liquid.
4. A chemical process in which the percentage of oxygen decreases in the substance or the percentage of hydrogen increases in it.
5. A collision between a stationary object and a moving object having the same mass in which kinetic energy is lost.
6. The time taken for the moving object to stop.
7. A salt whose colour changes from blue to pink when drops of water are added to it.

8. The scientist who formulated the laws of motion and the universal law of gravitation.
9. Ignition of materials without the presence of an external source of heat.
10. A chemical reaction that results in the release of heat energy from the reaction products to the surrounding environment.
11. The distance travelled by the moving object during the stopping time.
12. A simple model that illustrates the three main elements of the combustion process.
13. The reaction of heating aluminum with red iron oxide.
14. A chemical process in which the bonds in the molecules of the reactants are broken and new bonds are formed in the molecules of the products.
15. The non-renewable fuel which is the most used worldwide till now.
16. A device used to keep the velocity of cars constant on highways without direct driver intervention.
17. The combination of fuel with oxygen, accompanied usually by the emission of light, heat, or both.
18. A scientist who believed that objects do not continue moving unless a force acts continuously on them.
19. The temperature at which fuel begins to ignite.
20. A safety device that works with the seat belt in the car to prolong the time of collision, and thus reduce the rate of change in velocity, which in turn minimizes the force of collision acting on the driver.
21. Reactions that require the absorption of thermal energy from the surrounding environment, causing its temperature to decrease.
22. A chemical process in which the percentage of oxygen increases in the substance or the percentage of hydrogen decreases in it.
23. The amount of energy produced from the combustion of 1 g of fuel in excess oxygen gas.
24. Substances whose molecules are linked to a specific number of water molecules through an exothermic process.
25. For every action, there is an equal and opposite reaction.

26. The substance that takes away oxygen or gives hydrogen during the chemical reaction.
27. The change in the velocity of an object per unit time.
28. Cans used for warming coffee or heating the food inside them.
29. A closed and repeated thermal process, in which heat is withdrawn from inside the refrigerator to the outside, using eco-friendly freons.
30. A collision between a stationary object and a moving object having the same mass and no loss of kinetic energy occurs.
31. Dissolution accompanied by a rise in the temperature of the surroundings.
32. A physical change accompanied by the absorption of thermal energy from the surroundings when a substance dissolves in water.
33. The substance that gives oxygen or takes away hydrogen during the chemical reaction.
34. An object keeps its state of rest or motion at a constant velocity in a straight line, unless acted upon by external unbalanced forces that change its state.
35. Compresses used only once, in which endothermic or exothermic dissolution occurs.
36. The total force in magnitude and direction resulting from the effect of a number of forces acting on an object.
37. The name given to the calcium hydroxide produced by the reaction of quicklime with water.

Q8 Give Reason

1. When you rub your hands with an antiseptic hand gel, you feel your hands are cold.
Because alcohol in the gel evaporates, absorbing heat from the hands.
2. The transformation of a substance from one state to another is accompanied by a thermal change.
Because it involves loss or absorption of thermal energy to or from the surroundings.
3. The sublimation process is endothermic.
Because it absorbs thermal energy from the surroundings.

4. The refrigerator preserves food from spoilage.
Because it withdraws heat from inside and transfers it to the surrounding air using a refrigerant.
5. The dissolution process is accompanied by a thermal change.
Because it involves loss or absorption of thermal energy.
6. The dissolution of anhydrous lithium chloride salt in water is exothermic.
Because it increases the temperature of the solution.
7. The process of converting anhydrous salts to hydrated salts is reversible.
Because adding water turns them into hydrated salts, and heating turns them back into anhydrous salts.
8. It is preferable to use several polystyrene cups in laboratory experiments.
To increase thermal insulation.
9. The thermite reaction is used in railway track welding.
Because it is highly exothermic, producing molten iron.
10. When diluting concentrated nitric acid, the acid is dripped onto the inner walls of the water container.
Because water absorbs the released heat safely without damage.
11. Instant cold compresses reduce swelling.
Because they narrow blood vessels, reducing blood flow to the injured area.
12. Instant hot compresses relieve pain from muscle strain.
Because they widen blood vessels, increasing blood flow and relaxing muscles.
13. Chemical reactions usually involve thermal changes.
Because bond breaking and bond forming absorb and release unequal amounts of energy.
14. The reactions of acids with alkalis are exothermic.
Because more energy is released during bond formation than absorbed during bond breakage.
15. Coffee can be warmed in self-heating cans without external heat.
Because calcium oxide reacts with water exothermically, releasing heat.

- 16.** Adding barium hydroxide powder to ammonium chloride powder decreases temperature.
Because it is an endothermic reaction absorbing heat.
- 17.** The decomposition of ozone gas in the atmosphere is endothermic.
Because more energy is absorbed in bond breaking than released in bond formation.
- 18.** Ethyl alcohol is considered a renewable energy resource.
Because it is prepared from plants rich in starch such as corn.
- 19.** The use of biofuel is preferred over fossil fuel.
Because biofuel is renewable, while fossil fuel is non-renewable.
- 20.** A very small amount of ethanethiol gas is added to natural gas and butane gas.
To detect leaks, since both gases are odourless, and ethanethiol has a garlic smell.
- 21.** Bunsen flame has different colours.
Because of varying oxygen amounts: limited oxygen gives a yellow flame, abundant oxygen gives a blue flame.
- 22.** The flame of a paraffin candle under a bell jar goes out in minutes.
Because oxygen inside the jar is depleted.
- 23.** Combustion of steel wool in pure oxygen is faster than in air.
Because pure oxygen concentration is higher, increasing the combustion rate.
- 24.** Ignition of a matchstick when struck against a rough surface.
Because friction generates heat to start the exothermic reaction.
- 25.** The ignition point determines how dangerous the fuel is.
Because lower ignition point means higher flammability and greater danger.
- 26.** Combustion of hydrocarbons in air forms CO_2 and H_2O .
Because hydrocarbons contain carbon and hydrogen elements.
- 27.** The oxyacetylene flame is used in cutting and welding metals.
Because it reaches 3000°C , sufficient to melt metals.
- 28.** The car engine cannot operate without fuel.
Because the combustion triangle is incomplete without fuel.
- 29.** Frying pan fires are extinguished by covering with a metal lid.
Because oxygen is isolated, breaking the fire triangle.

- 30.** The reaction of magnesium with hydrochloric acid is called an exothermic reaction.
Because it releases heat energy to the surroundings.
- 31.** The wet piece of wood under the flask adheres to its base when barium hydroxide reacts with ammonium chloride.
Because the reaction absorbs heat, cooling the flask and causing condensation that makes the wood stick.
- 32.** The reaction of the formation of water from hydrogen and oxygen is an exothermic reaction.
Because it releases a large amount of heat and light energy.
- 33.** Cooling of the surrounding medium in endothermic reactions.
Because the reaction absorbs heat energy from the surroundings.
- 34.** Use of calcium oxide (quick lime) in self-heating packaging.
Because it reacts with water and releases heat energy.
- 35.** A small percentage of ethanethiol gas is added to natural gas and butane gas.
Because it gives a strong smell to detect gas leaks.
- 36.** The elements (fuel, oxygen, heat) are called the triangle of fire.
Because all three are essential for combustion to occur.
- 37.** Hydrogen is considered the "fuel of the future".
Because it is clean, produces only water when burned, and has high energy content.
- 38.** The matchstick ignition when it rubs against a rough surface.
Because friction generates heat that ignites the chemicals on the match head.
- 39.** The burning candle goes out when covered with a glass bell.
Because oxygen is consumed and combustion stops.
- 40.** Benzene flames are sometimes yellow and sometimes blue.
Because incomplete combustion produces carbon particles (yellow flame), while complete combustion produces a blue flame.
- 41.** It prevents extinguishing sodium or potassium fires with water.
Because they react violently with water, producing hydrogen gas and heat, which increases the fire.
- 42.** Water is not used to extinguish petroleum fires.
Because petroleum floats on water and continues burning.

- 43.** The passengers of the bus rush forward when it comes to a sudden stop.
Because of inertia — their bodies tend to continue moving forward.
- 44.** Drivers are always advised to use a seatbelt in cars.
Because it prevents them from rushing forward during sudden stops or collisions.
- 45.** The static bag on the counter remains at rest unless affected by an external force.
Because of Newton's first law (law of inertia).
- 46.** A large truck loaded with goods is harder to park than a small car moving at the same speed.
Because the truck has greater mass and inertia.
- 47.** Boats rush back into the water when a person jumps out of them.
Because of Newton's third law — action and reaction.
- 48.** The acceleration of an object increases as the resulting force exerted on it increases (when the mass is constant).
Because of Newton's second law ($F = m \times a$).
- 49.** A bucket of sand is kept in school laboratories.
To extinguish fires of metals like sodium and magnesium by isolating them from oxygen.
- 50.** It is forbidden to extinguish sodium or potassium fires with water.
Because water reacts with these metals exothermically, releasing hydrogen and intensifying the fire.
- 51.** Carbon dioxide gas is used in extinguishing fires.
Because it does not burn and does not support burning.
- 52.** Water is used in extinguishing paper and wood fires.
Because its high specific heat absorbs large amounts of thermal energy, lowering temperature.
- 53.** Water is not used in extinguishing petroleum oil fires.
Because oil floats on water, spreading the fire instead of extinguishing it.
- 54.** Oxidation and reduction processes are simultaneous.
Because when one substance gains oxygen (oxidized), another loses it (reduced); similarly with hydrogen.
- 55.** Air evacuation preserves food longer.
Because low oxygen reduces oxidation and reduction reactions spoil food.

Q9 What Happens If

1. Rubbing your hands using laundry powder (washing powder) and water (thermal change).
Your hands feel warm.
2. The transformation of a substance from the solid state to the gaseous state directly (thermal change).
The temperature of the surroundings decreases.
3. Adding ammonium nitrate to a polystyrene cup containing 100 mL of water (thermal change).
The temperature of the surroundings decreases.
4. Increasing the mass of sodium hydroxide dissolved in water (thermal change).
The amount of change in temperature increases.
5. Heating blue hydrated copper sulphate salt (colour change).
It turns into white anhydrous copper sulphate.
6. Adding water to anhydrous cobalt chloride (colour change).
It turns into pink hydrated cobalt chloride.
7. Diluting concentrated hydrochloric acid by adding water to it.
A large amount of thermal energy is released, leading to violent instant boiling of water and splashing of acid outside the container.
8. Doubling the mass of solute while keeping the volume of solvent constant (temperature).
The temperature usually changes by a constant amount.
9. Pressing on instant cold compresses.
The thin bag ruptures, causing the solute to mix with water and an endothermic dissolution occurs.
10. The occurrence of a chemical reaction in terms of bonds.
Reactant bonds are broken (endothermic), and new product bonds are formed (exothermic).
11. The reaction of magnesium with dilute hydrochloric acid.
Thermal energy is released, raising the temperature of the surroundings.
12. Pressing the button at the bottom of a self-heating can.
The membrane ruptures, calcium oxide reacts with water, forming calcium hydroxide and releasing heat.

13. Combustion of hydrocarbons (as methane gas) in air.

Carbon dioxide gas and water vapour are formed through an exothermic reaction.



14. Complete combustion of acetylene gas in the presence of excess oxygen gas.

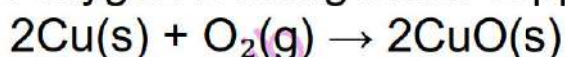
The oxyacetylene flame is formed, which reaches a temperature of 3000°C.

15. Drops of glycerin are added to potassium permanganate powder.

A spontaneous exothermic reaction occurs, leading to smoke emission and a purple-coloured flame.

16. A stream of air is passed over red-hot copper powder.

Copper combines with oxygen forming black copper oxide.



17. A stream of hydrogen gas is passed over black copper oxide with heating.

Reddish-brown copper is formed. $\text{CuO}(\text{s}) + \text{H}_2(\text{g}) \rightarrow \text{Cu}(\text{s}) + \text{H}_2\text{O}(\text{v})$

18. Dipping two rods of copper and zinc into two lemons and connect them to LED bulb.

The LED bulb lights up because a chemical reaction in the lemon produces electricity (lemon battery).

19. Increasing the bond energy in the reactant molecules relative to their ease of breakage.

The reaction becomes slower because stronger bonds require more energy to break.

20. A chemical reaction occurs in which the energy released during bond formation is "less" than the energy absorbed to break the bonds.

The reaction is endothermic because it absorbs more energy than it releases.

21. Adding aluminum oxide powder to iron oxide (thermite reaction).

Molten iron is produced because the reaction is highly exothermic.

22. The resulting force acting on an object if it is exerted by two forces of equal in magnitude and opposite in direction.

The net force is zero, so the object remains at rest or continues moving uniformly.

23. Decreased amount of oxygen during the combustion of a benzene flame.

The flame turns yellow due to incomplete combustion.

24. Passing a stream of hydrogen over heated black copper oxide.

Copper is formed and water vapor is produced because hydrogen reduces copper oxide.

25. Add drops of glycerin to potassium permanganate powder.

The mixture ignites because the reaction is strongly exothermic.

26. Placing a piece of steel wool wire on fire in a laboratory with pure oxygen.

The steel wool burns vigorously with bright sparks because oxygen concentration is high.

27. Air is released from an inflated balloon on the left (for the balloon movement).

The balloon moves to the right due to Newton's third law

28. The distance covered by the truck to stop when the brakes are pressed if its load (mass) increases.

The stopping distance increases as greater mass increases inertia.

29. The speed of a car if it is exerted by a force in the same direction as its movement.

The car's speed increases because the force adds to its motion.

30. Pulling quickly a tablecloth from under food plates.

The plates remain in place due to inertia (Newton's first law).



1. امسح الكود
2. اختار مرحلتك
3. شوف الشرح كامل مجاتا
وتابع الشيكات

Answers

Q1 Choose the Correct Answer:

1. b	2. d	3. c	4. c	5. c	6. d	7. c	8. b	9. b	10. c
11. b	12. c	13. c	14. d	15. b	16. c	17. c	18. c	19. b	20. b
21. b	22. c	23. c	24. a	25. c	26. b	27. c	28. d	29. d	30. b
31. c									

Q2 Correct the wrong statements

1. $\times \rightarrow \checkmark$ T_2 higher than T_1 in exothermic reactions
2. $\times \rightarrow \checkmark$ CaCO_3 decomposition is endothermic
3. $\times \rightarrow \checkmark$ Stronger bonds (higher energy) are harder to break
4. $\times \rightarrow \checkmark$ Endothermic reactions cool surroundings
5. $\times \rightarrow \checkmark$ $\text{CaO} + \text{H}_2\text{O}$ is exothermic (self-heating packs)
6. $\times \rightarrow \checkmark$ Natural gas is mainly methane
7. $\times \rightarrow \checkmark$ Oxidation = gain oxygen / lose electrons
8. $\times \rightarrow \checkmark$ Reducing agent = removes oxygen / donates electrons
9. $\times \rightarrow \checkmark$ Hydrogen has higher calorific value than wood
10. $\times \rightarrow \checkmark$ Acceleration decreases as mass increases (F constant)
11. $\times \rightarrow \checkmark$ Action-reaction act on different bodies
12. $\times \rightarrow \checkmark$ Newton's first law = inertia; second law = $F = ma$
13. $\times \rightarrow \checkmark$ Equal opposite forces along same line cancel (resultant = 0)
14. $\times \rightarrow \checkmark$ Mass is scalar, not vector

Q3 Complete the following sentences:

- | | | |
|--|--|-----------------------------------|
| 1. Their velocities are exchanged | 10. Heat, sound | 19.78%, 21% |
| 2. Newton (N), (m/s^2) , (m/s) | 11. Greater than | 20. Inertia |
| 3. Electrical energy | 12. Biofuel, artificial fuel | 21. $F = m \times a$ |
| 4. Unbalanced force | 13. Welding rails, exothermic reaction | 22. Oxidation |
| 5. Seat belt | 14. Created or destroyed | 23. Reducing agent |
| 6. Water jet pack | 15. Oxidation, reducing agent | 24. 3200°C , metals |
| 7. Drone (quad-copter) | 16. Reduction, oxidizing agent | 25. Newton (N), (m/s^2) |
| 8. Elastic collision | 17. Remains at rest or uniform motion, changes its state of motion | 26. Law of inertia |
| 9. Endothermic, exothermic | 18. Exothermic reactions | 27. Magnitude, direction |

Q4 Explain the meaning of each of the following:

1. Reactions that release thermal energy to the surroundings, causing the temperature of the surroundings to rise.
2. A closed and repeated thermal process in which heat is withdrawn from inside the refrigerator and transferred to the surrounding air using a refrigerant.
3. A flammable material used to produce heat as a result of an exothermic reaction.
4. If a net force acts on an object of mass m , it produces acceleration a in the same direction ($F = m \times a$).
5. The amount of heat absorbed or released when dissolving a specific quantity of solute in a known volume of solvent to form a solution.
6. A physical change accompanied by the release of thermal energy to the surroundings when a substance dissolves in water.
7. The rate of change of velocity per unit time.
8. A physical change accompanied by the absorption of thermal energy from the surroundings when a substance dissolves in water.
9. Energy is neither destroyed nor created, but can be transformed from one form to another.
10. The distance traveled by a moving object during stopping time.
11. Reactions that absorb thermal energy from the surroundings, causing the temperature of the surroundings to decrease.
12. The amount of energy produced from the combustion of 1 g of fuel in excess oxygen.
13. The temperature at which a material begins to ignite.
14. Ignition of materials without an external heat source.
15. A chemical process in which oxygen content increases or hydrogen content decreases in a substance.
16. For every action, there is an equal and opposite reaction.
17. A chemical process in which oxygen content decreases or hydrogen content increases in a substance.
18. The process of combining fuel with oxygen, usually accompanied by the emission of light and heat.
19. A substance that donates hydrogen or removes oxygen from another substance during a reaction.
20. An object remains at rest or in uniform motion unless acted upon by external unbalanced forces.
21. A substance that donates oxygen or removes hydrogen from another substance during a reaction.
22. The total force in magnitude and direction resulting from multiple forces acting on an object.
23. The time taken for a moving object to stop.

Q5 Variant Questions

1. (1) An oxidation process occurs to ammonia gas (NH_3).
A reduction process occurs to oxygen gas (O_2).
(2) Ammonia gas (NH_3).
(3) $\text{NH}_3(\text{g}) + 3\text{O}_2(\text{g}) \rightarrow 2\text{N}_2(\text{g}) + 6\text{H}_2\text{O}(\text{l})$
2. Food is preserved by vacuuming the air because this provides a poor-oxygen environment, which minimizes the redox reactions that lead to spoiling of food.
3. 5 m/s^2 .
4. 150 N .
5. Endothermic: melting – evaporation – sublimation
Exothermic: freezing – condensation – deposition
6. Store chemical energy which changes into electric energy
7. (1) Exothermic reaction / Because it is accompanied by the release of thermal energy as a product of the reaction to the surroundings.
(2) The energy released during forming new bonds is the greatest.
8. $\text{NaOH}-\text{CaCl}_2-\text{Na}_2\text{CO}_3$
9. $\text{Al} + \text{Fe}_2\text{O}_3(\text{s}) \rightarrow \text{Al}_2\text{O}_3(\text{s}) + 2\text{Fe}(\text{l}) + \text{heat}$
The importance of the reaction :
It is used in welding the railway tracks.
10. $-5 \text{ }^\circ\text{C}$ endothermic
11. Because gas exiting backwards (action) pushes the rocket forward (reaction)
12. 4 m/s^2 .
13. Acceleration decreases to half because $a = F/m \rightarrow F/2m = a/2$.
14. Newton's Second Law — increasing force while mass remains constant increases acceleration.
15. The lighter ball is affected more because it has less mass, so the same force produces greater acceleration ($a = F/m$).
16. Because the wall exerts an equal and opposite reaction force back on the person, and the wall is fixed to the ground so it cannot move.
17. Newton's First Law (Inertia) an object continues moving at constant speed unless acted upon by an external force.
18. 1.3 m/s^2

Q6 Write the scientific term

1. Luminous insects use light as a result of exothermic reactions inside their bodies in various purposes such as mating and self-defense.
2. Warming coffee or heating the foods inside it without the need for an external heat source.
3. This reaction is used in welding the railway tracks.

- 4.It is used as fuel for cars in some countries after mixing it with gasoline.
- 5.It is used as fuel for cars and trucks powered by fuel cells (hydrogen fuel cells).
- 6.They are the main fuels used in households.
- 7.It is added with very small amount to natural gas and butagas to take the appropriate safety measures in case of gas leaks.
- 8.It is used as a source of heat in laboratories.
- 9.They produce a spark used to ignite the mixture of gasoline and air in the combustion chamber of the car engine during starting.
- 10.It is used for cutting and welding metals, such as steel (iron) and copper.
- 11.They are used to isolate fires from air (oxygen).
- 12.It is used in extinguishing fires of some metals, such as sodium and magnesium fires.
- 13.Fuel removal.
- 14.It is used to measure the force.
- 15.Keeps the velocity of the cars constant on highways without any direct driver intervention, through using sensors.
- 16.Reduces the rushing forward of the driver towards the steering wheel or the windshield during sudden stopping.

Q7 Write the scientific term

- | | | |
|--|----------------------------|--|
| 1.Bunsen flame | 13.Thermite reaction | 27.Acceleration |
| 2.Galileo | 14.Chemical reaction | 28.Self-heating cans |
| 3.Eco-friendly freons | 15.Fossil fuel | 29.Refrigeration cycle in the refrigerator |
| 4.Reduction process | 16.Cruise control | 30.Elastic collision |
| 5.Inelastic collision | 17.Combustion | 31.Exothermic dissolution |
| 6.Stopping time | 18.Aristotle | 32.Endothermic dissolution |
| 7.Anhydrous cobalt chloride salt | 19.Ignition point | 33.Oxidizing agent |
| 8.Isaac Newton | 20.Airbag | 34.Newton's first law (Law of Inertia) |
| 9.Spontaneous combustion | 21.Endothermic reaction | 35.Instant cold and hot compresses (packs) |
| 10.Exothermic reaction | 22.Oxidation process | 36.Net force |
| 11.Stopping distance | 23.Calorific value of fuel | 37.Limewater |
| 12.Fire triangle (combustion triangle) | 24.Hydrated substances | |
| | 25.Newton's third law | |
| | 26.Reducing agent | |



1. امسح الكود
2. اختار مرحلتك
3. شوف التشرح كامل مجاناً وتابع الشبكات

كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9

